Verde Watershed

Watershed Description

This watershed is defined by the Verde River drainage that flows into the Salt River, including Big Chino Wash and its tributaries. This 6,624 square mile watershed has an approximate population of 153,000 people (2000 census), but is growing rapidly. Although this is only 3% of the state population, several communities are located in this watershed: Payson, Sedona, Cottonwood, Verde Valley, Prescott, and the southern outskirts of Flagstaff. Land ownership is 65% federal, 23% private, 10% state, and 2% tribal. Primary land uses are open range grazing, irrigated agriculture, recreation, forestry, and some mining.

Elevations range from more than 12,000 feet (above sea level) in the San Francisco Mountains to about 1,600 feet as the Verde River flows into the Salt River. The watershed is split between warmwater communities below 5,000 feet and coldwater communities above 5,000 feet where perennial waters exist.

Water Resources

The Verde Watershed receives slightly more precipitation than most watersheds in this state, with some areas receiving about 20 inches of rain and 3 inches of snow. Therefore, the Verde River and many of its tributaries are perennial waters.

An estimate of surface water resources in the Verde Watershed is provided in **Table X.** Waters on Indian lands are not assessed by ADEQ; therefore, those statistics are shown separately.

Table X. Estimated Surface Water Resources in the Verde Watershed

	Perennial	Intermittent	Ephemeral
Stream miles	450	2,115	5,990
	Perennial	Non-perennial	
Lake acres	4,603	3,636	

On Tribal Land – Not Assessed

	Perennial	Intermittent	Ephemeral
Stream miles	15	5	230
	Perennial	Non-perennial	
Lake acres	6	0	

Ambient monitoring focuses on perennial waters; however, special investigations may identify water quality problems on intermittent and even ephemeral waters. Estimated miles and acres are based on USGS digitized hydrology at 1:100,000 and have been rounded to the nearest 5 miles or 5 acres.

Map of watershed showing:

Generalized topography
Highways
Cities
National Forests, Monuments, Refuges
HUCs (the subdivisions by number)

Watershed Partnerships

The following watershed groups are active in this watershed:

- Citizens Water Advocacy Group
  The area of concern includes the upper Verde River and Prescott Active Management Area. Its primary objective is to promote sustainable water resources into the future. The group meets on the 2nd Saturday of each month in Prescott. For information, contact (928) 443-5353 or water@commspeed.net.

- Hyde Mountain Vista Group
  The Walnut Creek stream reaches between Apache Creek and Juniper Mesa Wilderness. Goal is to maintain the diversity, ecological integrity, historic value, and undeveloped nature of the public and private lands in and around the Santa Maria and Juniper Mountains, while maintaining economic viability. Focus is on restoration of the upper Walnut Creek drainages, tributaries to Big Chino Wash and Verde River. Group meets as needed. Contact Susan Brook, Administrative Assistant, (928) 541-7538, hydemountainvista@yahoo.com.

- North Central Arizona Regional Watershed Consortium (NCARWC)
  The area of concern is the Verde Watershed within Yavapai County. The group was formed to accomplish cooperative regional water management and water rights. NCARWC believes that a unified and knowledgeable voter base in rural Arizona may be able to effect needed changes in Arizona's water laws and statutes. Contact Anita Rochelle (President) at anitar772002@yahoo.com or riverwoman@verdenet.com; or Bill Goss at bill@billgoss.net.

- Oak Creek Canyon Task Force
  The Task Force was created to conserve and enhance natural resources and recreational opportunities, sustain and improve recreational opportunities, improve water quantity and quality, reduce damage due to storms, floods, human activities, or natural disasters, and engage public and government involvement through outreach and education. Meetings occur on the 2nd Thursday of the month in Sedona. Contact Barry Allen (623) 551-8804, nelsenallan@earthlink.net, or Morgan Stine at morgan@hughes.net.

- Prescott Creeks Preservation Association (Prescott Creeks)
  The mission of Prescott Creeks is to protect and celebrate the ecological integrity of Granite Creek Watershed riparian systems and associated wetlands through conservation, restoration, and education. This is accomplished through programs that include: Watson Woods Riparian Preserve, Prescott Creek Watch Network and watershed monitoring. Meetings dates and times vary. Contact (928) 445-5699, info@prescottcreeks.org, mbyrd@prescottcreeks.org, or www.prescottcreeks.org.

- Stewards of Public Lands
  Area of concern is the upper portion of the middle Verde (HUC 15060202). Area citizen volunteers are partnering with businesses, municipalities, State Lands Department, and the US Forest Service to clean up illegal dumping areas on public lands and to improve watershed and stream health. They meet on the first Monday of the month in Cottonwood, AZ. Contact Diane Jones, (928) 634-4112, dianej@sedona.net, or www.verdeconnections.com.

- Stoneman Lake Property Owners Association
  Stoneman Lake is a 900 acre lake drainage area 40 miles south of Flagstaff Arizona. The association's missing is to preserve the pristine environment and foster harmony and cooperation among neighbors. Contact Chris Estes, President at (480) 585-5772, cklestes@msn.com, or Bill McPeters, Vice President, (602) 431-1513, wedigit@juno.com.

- Verde River Citizens Alliance

This corporation was formed for philanthropic, educational, and scientific purposes. Its main objectives are to assure an adequate flow of water throughout the Verde and preserve and restore riparian habitat along the Verde River and its tributaries. It meets on Saturdays in Cottonwood, AZ. Contact Bill Goss, President, at (928) 649-2422, vrca@verdenet.com, billgoss@cableone.net, or www.verdevirervrca.org.

- Verde Watershed Association
  This group works to conserve, sustain, and improve the diversity of natural resources and recreational opportunities, while reducing impacts from human activities, across the Verde Watershed. It uses outreach and education to engage public and government involvement in water related issues. The Verde Watershed Association meets on the 3rd Wednesday of the month. Contact Loyd Barnett, President, (928) 284-0161, lbarnettaz@npgcable.com or verdewatershed@yahoo.com, or http://vwa.southwest-water.org.

- Yavapai County Water Advisory Committee
  This committee is committed to preserving sustainable water resources for future generations while enhancing the economic viability of Yavapai County. The objective is develop and enact a water management and conservation strategy to ensure sustained use of water resources, while protecting base flows in rivers and streams. The committee meets on the 3rd Wednesday of the month. Contact John Rasmussen at john.rasmussen@co.yavapai.az.us, (928) 442-5199, or http://www.co.yavapai.az.us/orggroups/wac/wachome.asp.

Special Studies and Water Quality Improvement Projects

Total Maximum Daily Load Analyses – The following TMDL analyses have been completed, are ongoing, or are scheduled to be completed in this watershed. Further information about the status of these investigations or a copy of the TMDL, if completed, can be obtained at ADEQ's website: www.azdeq.gov.

- **East Verde River is impaired by arsenic, boron, and selenium.**
  Arsenic and boron present public health risks to people using the water as a domestic drinking source. There is evidence that the exceedances are more likely to occur during low flow periods when groundwater is the main contributing factor, but further investigation is needed to fully determine source loadings. The TMDL for arsenic and boron is scheduled to be completed in 2008. Selenium concentrations represent a risk to aquatic life and animals that prey on them, but does not pose a risk to human health at levels found. Further monitoring and investigation is needed to determine source loadings and contribution from natural sources. The TMDL investigation is scheduled to be initiated in 2010.

- **Granite Basin Lake was investigated due to low dissolved oxygen and potentially excess nutrients.**
  A TMDL study in 2004 found that the low dissolved oxygen levels were naturally occurring, and therefore, the lake was delisted.

- **Oak Creek is impaired by *Escherichia coli* bacteria.**
  Exceedances of *Escherichia coli* bacteria standard may represent a significant public health concern if people are swimming or even wading in the water. To protect the public, Slide Rock State Park closes their swimming area when bacteria standards are exceeded.

  A TDML for *E. coli* on Oak Creek was approved in 1999. To meet standards, the following strategies were to be implemented:
  - Reduce sediment loading to Oak Creek, as bacteria were associated with the sediment;
  - Identify failing septic systems and repair or replace these systems;

- Reduce recreation impacts on water quality (e.g., improved public restroom and shower facilities, improved trash management); and
- Reduce animal waste impacts on water quality (e.g., control drainage from pastures and trails, control litter and other wastes that attract skunks and raccoons).

Many of these strategies have been implemented through the efforts of the Oak Creek Task Force using Water Quality Improvement Grants and other funding sources (see projects below). For example, "Keep Oak Creek Canyon Beautiful" campaign arranges for volunteers to hand out litter bags and discuss waste disposal with summer holiday visitors who flock to Oak Creek during the big summer holidays. Hikers and picnickers are encouraged to haul out trash when they leave the creek area.

ADEQ initiated a Phase II TMDL in 2004 to measuring the effectiveness of the implemented management measures to reduce bacterial loading in Oak Creek, and further delineate the extent of the contamination, further study sources and loadings within the watershed. The TMDL study is also look at how lowering the *E. coli* standard in 2002 will impact achieving bacterial standards in Oak Creek.

- **A phosphorus and nitrogen (nutrient) TMDLs were completed on Oak Creek and Munds Creek in 1999.**
  The loading analyses indicated that Oak Creek's status as a Unique Water and the existing discharge limits to Oak Creek are sufficient protection. Using modeling, few nutrient standard violations would be predicted. No new nutrient limits were needed for septic system loadings on Oak Creek. Improvements to wastewater treatment systems on Munds Canyon had also been effective in eliminating nutrient exceedances.

- **Pecks Lake impairment by high pH and low dissolved oxygen (narrative nutrients).**
  A narrative nutrient TMDL was completed in 2000 for this 95 acre lake. Low dissolved oxygen and high pH were primarily caused by aquatic weed growth (macrophytes), which at times cover 90% of the lake surface. The TMDL concluded that a 25% reduction in nitrogen and phosphorus is needed through weed harvesting and reducing sediment transport into the lake.

- **Stoneman Lake is impaired by low dissolved oxygen and high pH (narrative nutrients).**
  The TMDL was completed in 2001 for this 120-acre natural lake. The nutrient TMDL was calculated for average hydrologic conditions, with critical conditions being summer, with high temperatures and peak macrophyte growth. Both dissolved oxygen and pH standards should be met with a 35% reduction in biomass density and biological oxygen demand. Due to an extensive state-wide drought, the lake went dry soon after the TMDL. Monitoring will be initiated when the lake refills and stabilizes. Some management actions were implemented to reduce potential loadings from septic systems and suspended sediment flowing into the lake during runoff events.

- **The Verde River impairment by suspended sediments/turbidity.**
  A turbidity TMDL was completed in 1999. Turbidity impairment appears to be directly correlated to large storm events, and no load reduction is necessary during average or base flow conditions (when exceedances do not occur). A variety of management actions were identified in the implementation plan to reduce sediment loading to the Verde River, including:
  - Improve livestock management practices
  - Designate off-highway vehicle areas and employ best management practices at these sites to reduce sediment transport;
  - Implement the "Red Rock Passport," a comprehensive recreation plan for the Sedona area where recreational opportunities would be limited on some heavily used areas to reduce soil compaction and erosion;
  - Establish grassland restoration projects to increase infiltration and reduce soil erosion by reducing pinyon and juniper densities and increasing vegetative ground cover.
  - Sponsor educational opportunities and public involvement in decisions regarding long-term management of the watershed;

- Acquire land adjacent to the Verde River through land exchanges to reduce development in the active flood plain;
- Use fire treatments to reduce adverse watershed effects from uncontrolled wildfire; and
- Maintain and modify water catchment structures to reduce the amounts of fine sediments traveling through the system.

- **Watson Lake is impaired due to nitrogen, low dissolved oxygen, and pH.**
  Watson Lake has excess nutrient loading (nitrogen) which is also causing low dissolved oxygen and high pH. Further monitoring and investigation is needed to determine source loadings and contribution from natural sources. The TMDL investigation is scheduled to be initiated in 2010.

- **Whitehorse Lake is impaired due to low dissolved oxygen.**
  Low concentrations of dissolved oxygen may represent a risk to aquatic life and may indicate excess nutrient loading to the lake. A TMDL was initiated in 2006 to determine the cause of the low dissolved oxygen.

Water Quality Improvement Grant Projects – ADEQ awarded the following Water Quality Improvement Grants (319 Grants) in this watershed. More information concerning these grants or projects can be obtained at: http://www.azdeq.gov/environ/water/watershed/fin.html.

- **Verde River Headwaters Riparian Restoration Demonstration Project**
  Blue Ridge and Long Valley Ranger Districts (2000)
  Revegetate the riparian area along West Clear Creek to stabilize banks and decrease channel cutting, thereby reducing sediment.

- **Cornville Watershed Project**
  Yavapai County Flood Control (2000)
  Revegetate the riparian area with native vegetation, provide rip rap and other structures, and reconstruct the Greenwell Slough to catch sediment and slow storm water flow. Greenwell Slough is adjacent to Oak Creek.

- **Water Quality Guardian Program**
  Oak Creek Task Force (2001)
  Install public restrooms, public showers, and sediment reduction facilities to reduce impacts of human activities on Oak Creek and reduce bacteria loading to the stream.

- **Sedona Gun Range Lead Removal and Site Restoration Project**
  Coconino National Forest (2002)
  Remove lead and aromatic hydrocarbon contamination from the Sedona Gun Range which is located along Mormon Wash, which flows into Oak Creek.

- **Fecal Coliform and Sediment Reduction for Oak Creek Project**
  Coconino National Forest (2002)
  Stabilize and restore 10 acres of bare ground at five sites to reduce erosion and improve long-term soil productivity. Install three restrooms at popular trailhead sites to eliminate potential for fecal coliform contamination. Public outreach will include interpretive signs near the toilet facilities.

- **Upper Verde Collaborative Watershed Restoration Project**
  EcoResults! Inc. (2002)
  Create new pastures for grazing, remove juniper trees, and reclaim gullied roadways and eroding rangelands through hay trampling. Public outreach provided through education workshops to educate ranchers, agency personnel, and other individuals in the Prescott and Chino Valley area.

- **West Clear Creek Project**
  M Diamond Ranch (2003)
  Reduce runoff on rangeland adjacent to West Clear Creek by installing fences, a corral, and an alternative water system as part of a rotational grazing management plan.

- **Keep Oak Creek Beautiful Campaign**
  Oak Creek Task Force (2004)
  Provide toilets and wastewater treatment system at Indian Gardens Visitor Center. Provide sediment control structures throughout Oak Creek Canyon. Develop a Task Force webpage. Expand the "Keep Oak Creek Canyon Beautiful" campaign for waste removal by people enjoying the canyon during holidays.

- **Ash Creek Watershed Project**
  Henry Dahlberg Foundation (2004)
  Remove sedimentation caused by road and steep side drainages along Ash Creek. Mitigate erosive effects of planned forest thinning and prescribed burns.

- **Upper Verde River Wildlife Area Turbidity Reduction Project**
  Arizona Game and Fish Department (2004)
  Exclude livestock from riparian areas using fencing, remove old roads and add barriers to control off-highway vehicle travel, adjust stream bank slope, and revegetate using native plants along flood plain terraces, close stream banks and other vulnerable areas to off-highway vehicles.

- **West Clear Creek Tributary Watershed Project**
  M Diamond Management LLC (2004)
  Collaborative project to reduce sediment loading and restore watershed function by improving ephemeral stream channels in tributaries to West Clear Creek.

- **Granite Creek Watershed Water Quality Improvement and Monitoring Project**
  Prescott Creeks Preservation Association (2006)
  Implement four management strategies to improve water quality:
  - Redesign and construct a faulty stormwater runoff basin,
  - Apply stenciling to storm drains to inform the public about the consequences of dumping waste down the storm drains,
  - Develop management strategies for ranchers and other owners of riparian areas and
  - Monitor for metals and bacteria to assess water quality improvement.

- **Hart Prairie Sediment Control Project**
  The Nature Conservancy (2006)
  Install French drains, water bars and elevated roadways within the Hart Prairie Preserve near Flagstaff to improve and protect rare Bebb willow wetlands.

Water Protection Fund Projects – The following Water Protection Fund Projects were awarded by the Arizona Department of Water Resources. More information about these funds or projects can be obtained from the ADWR web site at: http//www.azwater.gov.

- **Verde River Riparian Restoration Partnership Project**
  Mingus High School (2003)

- **Verde Headwaters 3-D Hydrogeological Model Project**
  Northern Arizona University (2004)
  Create and present a hydrogeological visualization of the Verde River headwaters area to help educate the public concerning ground water resources.

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- **Watson Woods Riparian Preserve Restoration Feasibility Project**
  Prescott Creeks Preservation Association (2004)
  Conduct a feasibility study to rehabilitate 1-mile segment of Granite Creek in the Watson Woods Riparian Preserve.

- **Verde Wild and Scenic River Fence Exclosure Project**
  Prescott National Forest (2005)
  Add fencing to exclude livestock in the Brown Springs allotment to implement the Verde Wild and Scenic River Comprehensive River Management Plan.

Other Water Quality Studies – The following additional water quality related studies were completed since 2000 in this watershed.

- ***Preliminary Ecological Assessment of Four Mogollon Rim Watersheds***
  Grand Canyon Wildlands Council, Inc.
  Conduct a preliminary ecological assessment of the invertebrates, vegetation, small mammals, and herptofauna on East Clear Creek, West Clear Creek, Wet Beaver Creek, and Chevelon Creek. This assessment is to provide management recommendations for non-native species control, habitat protection, resource potential, and abundance, distribution, and type of species observed. The data collection occurred in 2005 and reports are to be produced in 2006.

- ***Oak Creek Canyon Escherichia coli Genotyping Project***
  Paul Keim and Christine Keys, Northern Arizona University (2000)
  Escherichia coli bacteria were isolated from water and sediment samples collected at different sites along Oak Creek. These bacteria samples were then genotyped to differentiate the source of this fecal pollution (human, horse, deer). This study made the following conclusions:
    - Fecal contamination was higher during the summer months;
    - Fecal pollution came from multiple sources: elk, cow, human, dog, deer, raccoon, horse, skunk, llama, beaver, bear, and mountain lion;
    - Fecal pollution in Oak Creek is not a re-growth phenomenon;
    - Most of the fecal pollution comes from natural populations in the canyon (e.g., elk, deer), with seasonal impacts from human activities (human, horse, dog);
    - Genotypes in the water and in the sediment do not match at a site; therefore, they include bacteria being transported down the river; and
    - *E. coli* populations do over winter in sediment at a site, but are not a major contribution to the *E. coli* population found at that site during the summer.

- ***Verde River Assimilative Capacity – Data Summary Report***
  Tetra Tech, Inc. submission to ADEQ (2000)
  Significant population growth is projected for some portions of the watershed. This growth will increase nutrient loads from runoff in residential areas and contributions of on-site wastewater disposal via ground water. In addition, several cities and towns within the watershed have proposed new wastewater discharges to the Verde River of its tributaries. This is a study of the river's ability to accept additional nutrient loading and maintain water quality standards. The are of focus was from Perkinsville to Childs, a 90 mile stretch of the Verde River.

- ***Sources of Springs Supplying Base Flow to the Verde River Headwaters, Yavapai County, Arizona***
  Laurie Wirt and H.W. Hjalmarson, U.S. Geological Survey (2000)
  Multiple lines of evidence were used to identify source aquifers, quantify their contributions, and trace the ground water flow paths that supply base flow to the uppermost reach of the Verde River. The research showed that the interconnected aquifers in Big Chino Valley are the primary source of Big Chino Springs, presently supplying at least 80% of the upper Verde River's base flow.

- ***Verde Watershed Restoration Action Strategy***
  Verde Watershed Association (2000)
  This plan provides a description of the existing conditions and issues in the Verde Watershed and proposes ongoing and future projects and implementation actions. It will be updated periodically as projects are implemented and evaluated, making it a continuous, forward-looking plan. Potential implementation actions are identified and prioritized based on available resources and people or agencies willing to implement them.

- ***Lower Verde / Lower Salt River Management Plan and Restoration Strategy***
  Lower Verde / Lower Salt River Watershed Advisory Group (2000)
  This plan identifies the areas of greatest concern for water resources, initiates pollution source identification, and identifies programs and potential actions to remediate these sources.

- ***Occurrence and Quality of Surface Water and Ground Water within the Yavapai Prescott Indian Reservation, Central Arizona, 1994-98.***
  G.R. Littin, Margot Truini, H.A. Pierce, and B.M. Baum, US Geological Survey (2000)
  The Yavapai-Prescott Indian Reservation includes about 2 square miles near the City of Prescott. This is a study of the water resources provided by Granite Creek, which bisects this reservation, springs, and other ground water.

- ***Oak Creek Canyon Watershed Based Plan***
  Oak Creek Canyon Task Force (2002)
  This plan characterizes this sub-watershed, identifies pollutant sources and strategies to reduce these pollutants and agencies or individuals who should be involved in these actions. This plan focuses on nutrient and bacterial contamination issues.

- ***Contaminants in Fish and Birds of Watson Lake, Arizona 2000-2001***
  Carrie L.H. Marr and H. Maaike Schotborgh, U.S. Fish and Wildlife Service (2003)
  A wood treatment facility located on Yavapai-Prescott Indian Tribe land, near Prescott, released pentachlorophenol (PCP), arsenic, and chromium into the environment from 1961-1985. Sediment, water, fish crayfish, eggs, tadpoles, and frogs were sampled for trace elements, organochlorine insecticides, polyaromatic hydrocarbons, total polychlorinated biphenyls, dioxins, and furans. The report concluded that the former Southwest Forest Industries had minimal effect on Granite Creek and Watson Lake. Arsenic and chromium levels were elevated in fish; however the consequences of this elevation in fish tissue are unknown. Fish tissue PCP concentrations were lower than expected, probably due to removal and clean up of the PCP treatment pond from the site. Elevated levels of mercury in the fish tissue from Granite Creek and Watson Lake warrant further monitoring and evaluation to determine sources of the mercury and potential for reductions.

- ***Water Quality Data for Selected National Park Units, Southern and Central Arizona and West-Central New Mexico, Water Years 2003 and 2004***
  U.S. Geological Survey in cooperation with the National Park Service (2005)
  Field measurements and water samples were collected at springs, mine adits, streams, and wells at 30 sites in 9 park units in 2003-2004 to provide baseline (ambient) water quality information. Only 24 of the 30 sites were sampled three times due to drought conditions and lack of water during parts of the year.

- ***Assessment of Selected Inorganic Constituents in Streams in the Central Arizona Basins Study Area, Arizona and Northern Mexico, through 1998***
  David Anning – U.S. Geological Survey, National Water Quality Assessment Program (2003)
  Inorganic chemical data (dissolved solids, suspended sediment, and nutrients) and stream properties (temperature, pH, dissolved oxygen) were analyzed to assess water quality, determine natural and human factors affecting water quality, and compute stream loads.

- **Reservoir Studies**
  David Walker, University of Arizona
  This is an ongoing and comprehensive study of water quality in reservoirs serving the Phoenix metropolitan area. The goal is to use monitoring data to answer water quality management questions in a proactive manner. A yearly report is produced. In 2005, the report provided information about:
    - Climate and drought effects on water quality,
    - Wildfire effects on water quality,
    - Harmful algal blooms,
    - Atmospheric deposition and the use of sediment to look at accumulation of pollutants, and
    - Endocrine disruption compounds.

Assessments

The Verde Watershed can be separated into the following drainage areas (subwatersheds):

15060201	Big Chino Wash Drainage Area
15060202	Upper Verde River Drainage Area
15060203	Lower Verde River Drainage Area

These drainage areas and the surface waters assessed as “attaining” or “impaired” are illustrated on the following watershed map. Methods used to complete these assessments are described in the “Surface Water Assessment Methods and Technical Support” document (2006).

MAP

ASHBROOK WASH (Previously identified as Grande Wash) From Grande Wash to Verde River 15060203 – 989 2 Miles	USE SUPPORT	OVERALL ASSESSMENT	POLLUTANTS CAUSING IMPAIRMENT	IMPAIRMENT STATUS
	A&We – Inconclusive PBC – Inconclusive	Category 3 Inconclusive		Delist *E. coli.* Wastewater discharge no longer occurring.

MONITORING USED IN THIS ASSESSMENT

SITE NAMES ID # DATABASE #	AGENCY PURPOSE	SAMPLING PERIOD: 03/06/2000 NUMBER AND TYPES OF SAMPLES Metals	Nutrients – Related	Other
At Fountain Hills, AZ VRGRW001.64 101596	USGS Special investigation	1 dissolved sample: Antimony, arsenic, barium, beryllium, boron, cadmium, chromium, copper, lead, manganese, mercury, nickel, selenium, silver, zinc.	1 Ammonia, dissolved oxygen, pH, nitrite/nitrate, total nitrogen, total phosphorus, and total Kjeldahl nitrogen	1 *E. coli* bacteria 1 Total dissolved solids 1 Pesticides 1 VOCs (solvents) 1 Petroleum products

EXCEEDANCES

POLLUTANT	STANDARD UNIT DESIGNATED USES	DATES EXCEEDANCES	DESIGNATED USE SUPPORT SUPPORTING EVIDENCE AND COMMENTS
E. coli bacteria	576 CFU/100 ml PBC	03/06/2000 – 1000 CFU/100 ml	Inconclusive – 1 exceedance during the last 3 years of monitoring. Occurred during an illegal discharge of wastewater into what would be a dry wash. This discharge has not been occurring for more than 3 years.

Pollutant: Assume "total" concentration, unless shown as dissolved.
Frequency Exceed = Samples collected within a 7-day period are aggregated and counted as one sample per site.

DATA GAPS AND MONITORING NEEDS

EXCEEDANCES NEEDING MORE SAMPLES TO ASSESS	MISSING CORE PARAMETERS	MISSING SEASONAL DISTRIBUTION	DETECTION LIMITS NOT LOW ENOUGH
	Insufficient core parameters	Insufficient sampling events	
MONITORING RECOMMENDATIONS		Low Priority – Collect core parameters to represent at least three seasons during the assessment period.	

BARTLETT LAKE 15060203 – 0110 2375 Acres	USE SUPPORT	OVERALL ASSESSMENT	
	A&Ww – Attaining FBC – Attaining FC – Attaining DWS – Attaining AgI – Attaining AgL – Attaining	Category 1 Attaining all uses	

MONITORING USED IN THIS ASSESSMENT

SITE NAMES ID # DATABASE #	AGENCY PURPOSE	SAMPLE PERIOD: 03/02/2000 – 07/12/2005 NUMBER AND TYPES OF SAMPLES		
		Metals	Nutrients – Related	Other
At Dam VRBAR-A 100009	ADEQ and U of A Ambient	17-19 total metals and 5 -11 dissolved metals: Antimony, boron, cadmium, chromium, copper, lead, manganese, nickel, selenium, silver, and zinc. 7-19 total metals only: Mercury, thallium	31-40 Dissolved oxygen, pH, total nitrogen, total phosphorus, nitrite/nitrate, total Kjeldahl nitrogen	12 *E. coli* bacteria 6 Benzene, ethylbenzene; toluene, xylene 28 Fluoride; 15 Total dissolved solids; 31 Temperature; 27 Turbidity
At Bartlett Flats VRBAR-FLAT 102536	ADEQ Special Study			
At Marina – site 1 VRBAR-MAR1 100986	ADEQ Ambient			
Mid lake VRBAR-B 10010	ADEQ and U of A Ambient			
Riverine Zone VRBAR-C 10011	ADEQ and U of A Ambient			

EXCEEDANCES

POLLUTANT	STANDARD UNIT DESIGNATED USES	DATES EXCEEDANCES	DESIGNATED USE SUPPORT SUPPORTING EVIDENCE AND COMMENTS
No Exceedances			

Pollutant: Assume "total" concentration, unless shown as dissolved.
Frequency Exceed = Samples collected within a 7-day period are aggregated and counted as one sample (see assessment methods).

DATA GAPS AND MONITORING NEEDS

EXCEEDANCES NEEDING MORE SAMPLES TO ASSESS	MISSING CORE PARAMETERS	MISSING SEASONAL DISTRIBUTION	DETECTION LIMITS NOT LOW ENOUGH
None	All core parameters collected.		
MONITORING RECOMMENDATIONS		Low Priority – Note that the old turbidity standard (25 NTU) was exceeded in only 1 of 11 samples (129 NTU). Recommend using biocriteria assessments and bottom deposits implementation procedures in this reach, when they are adopted	

BEAVER CREEK From Dry Beaver Creek to Verde River 15060202 – 002 9.3 Miles	USE SUPPORT	OVERALL ASSESSMENT	
	A&Ww – Inconclusive FBC – Inconclusive FC – Inconclusive AgL – Inconclusive	Category 3 Inconclusive	

MONITORING USED IN THIS ASSESSMENT

SITE NAMES ID # DATABASE #	AGENCY PURPOSE	SAMPLING PERIOD: 11/26/2002 – 10/07/2003 NUMBER AND TYPES OF SAMPLES		
		Metals	Nutrients – Related	Other
Near Montezuma Castle National Park VRBEV005.74 101542	USGS Ambient	1 total and 3-4 dissolved samples: Antimony, arsenic, beryllium, boron, cadmium, chromium, copper, lead, manganese, nickel, and zinc 3 dissolved metals: Barium, silver, uranium 1 total and dissolved: mercury	3-4 samples: Dissolved oxygen, pH, phosphorus 1 sample: Ammonia, nitrite/nitrate, nitrogen, TKN	1 *E. coli* bacteria 1 Fluoride 1 Total dissolved solids; 1 Turbidity 1 Suspended sediment concentration
Above Verde River VRBEV000.72 100722	ADEQ Ambient			

EXCEEDANCES

POLLUTANT	STANDARD UNIT DESIGNATED USES	DATES EXCEEDANCES	DESIGNATED USE SUPPORT SUPPORTING EVIDENCE AND COMMENTS
No Exceedances			

Pollutant: Assume "total" concentration, unless shown as dissolved.
Frequency Exceed = Samples collected within a 7-day period are aggregated and counted as one sample (see assessment methods).

DATA GAPS AND MONITORING NEEDS

EXCEEDANCES NEEDING MORE SAMPLES TO ASSESS	MISSING CORE PARAMETERS	MISSING SEASONAL DISTRIBUTION	DETECTION LIMITS NOT LOW ENOUGH
None	Insufficient total nitrogen and phosphorus, mercury, *E. coli*, copper, and lead to assess A&W, FBC, and AgL.		Lab detection limits for selenium and dissolved mercury were higher than A&W chronic criteria.
MONITORING RECOMMENDATIONS		Low Priority – Collect missing core parameters to represent at least 3 seasons during the assessment period. Use lower lab detection limits for selenium and dissolved mercury. Beaver Creek had been impaired due to turbidity until the turbidity standard was replaced by the suspended sediment concentration (SSC) criteria. Suspended sediment samples should be collected in Beaver Creek. Also, recommend using biocriteria assessments and bottom deposits implementation procedures in this reach, when they are adopted.	

BITTER CREEK From Jerome WWTP to Yavapai Apache Indian Reservation 15060202 – 066B 1.6 Miles	USE SUPPORT	OVERALL ASSESSMENT	
	A&Wedw – Inconclusive PBC – Attaining AgL – Attaining	Category 2 Attaining some uses	

MONITORING USED IN THIS ASSESSMENT

SITE NAMES ID # DATABASE #	AGENCY PURPOSE	SAMPLING PERIOD: 11/12/2003 – 06/21/2004		
		NUMBER AND TYPES OF SAMPLES		
		Metals	Nutrients – Related	Other
0.5 miles below Jerome WWTP VRBIT003.93 100424	ADEQ Ambient	3-4 dissolved and total metal samples: Antimony, arsenic, beryllium, cadmium, chromium, copper, lead, manganese, zinc 4 total metals samples only: Boron, manganese 4 total and 2 dissolved: Lead, mercury 1 total: Selenium	4 samples: Ammonia, dissolved oxygen, pH, nitrite/nitrate, total nitrogen, total phosphorus, and total Kjeldahl nitrogen	4 *E. coli* bacteria 4 Suspended sediment concentration 4 Turbidity 4 Total dissolved solids

EXCEEDANCES

POLLUTANT	STANDARD UNIT DESIGNATED USES	DATES EXCEEDANCES	DESIGNATED USE SUPPORT SUPPORTING EVIDENCE AND COMMENTS
Selenium	2 µg/L A&Wedw chronic	05/04/2004 – 11 µg/L	Inconclusive – Only 1 exceedance during the assessment period. Lab detection limit on other selenium samples was too high to determine attainment.

Pollutant: Assume "total" concentration, unless shown as dissolved.
Frequency Exceed = Samples collected within a 7-day period are aggregated and counted as one sample (see assessment methods).

DATA GAPS AND MONITORING NEEDS

EXCEEDANCES NEEDING MORE SAMPLES TO ASSESS	MISSING CORE PARAMETERS	MISSING SEASONAL DISTRIBUTION	DETECTION LIMITS NOT LOW ENOUGH
Selenium	Collected all core parameters		Lab detection limits for selenium and dissolved mercury were higher than A&W chronic criteria
MONITORING RECOMMENDATIONS		Medium Priority – Collect additional selenium data due to the exceedance. Use lower laboratory detection limits for selenium and dissolved mercury.	

COLONY WASH From headwaters to Verde River 15060203 – 998 4.9 Miles	USE SUPPORT	OVERALL ASSESSMENT	
	A&We – Inconclusive PBC – Inconclusive	Category 3 Inconclusive	

MONITORING USED IN THIS ASSESSMENT				
SITE NAMES ID # DATABASE #	AGENCY PURPOSE	SAMPLING PERIOD: 01/24/2000 and 02/03/2003		
		NUMBER AND TYPES OF SAMPLES		
		Metals	Nutrients – Related	Other
At Fort McDowell boundary VRCLW002.11 101519	USGS Special Study	1-2 dissolved metal samples: Antimony, arsenic, beryllium, boron, cadmium, chromium, copper, lead, mercury, manganese, nickel, and zinc, selenium, silver, zinc	1-2 samples: Dissolved oxygen, pH, phosphorus 1 sample: Ammonia, nitrite/nitrate, nitrogen, TKN	1 *E. coli* bacteria 2 Fluoride 2 Total dissolved solids; 1 Turbidity 1-2 Pesticides 1-2 VOCs

EXCEEDANCES			
POLLUTANT	STANDARD UNIT DESIGNATED USES	DATES EXCEEDANCES	DESIGNATED USE SUPPORT SUPPORTING EVIDENCE AND COMMENTS
No Exceedances			

Pollutant: Assume "total" concentration, unless shown as dissolved.
Frequency Exceed = Samples collected within a 7-day period are aggregated and counted as one sample (see assessment methods).

DATA GAPS AND MONITORING NEEDS			
EXCEEDANCES NEEDING MORE SAMPLES TO ASSESS	MISSING CORE PARAMETERS	MISSING SEASONAL DISTRIBUTION	DETECTION LIMITS NOT LOW ENOUGH
	Insufficient core parameters	Insufficient sampling events.	Lab detection limits for selenium and dissolved mercury were higher than A&W chronic criteria.
MONITORING RECOMMENDATIONS		Low Priority – Collect missing core parameters to represent at least three seasons during an assessment period. Use lower lab detection limits for selenium and dissolved mercury.	

DRY CREEK From headwaters to Oak Creek 15060202 – 021 22.7 Miles	USE SUPPORT	OVERALL ASSESSMENT	
	A&Ww – Inconclusive FBC – Inconclusive FC – Inconclusive	Category 3 Inconclusive	

MONITORING USED IN THIS ASSESSMENT

SITE NAMES ID # DATABASE #	AGENCY PURPOSE	SAMPLING PERIOD: 01/11/2005 NUMBER AND TYPES OF SAMPLES		
		Metals	Nutrients – Related	Other
At Yavapai County stage logger VRDRY007.02 100656	ADEQ TMDL	1 dissolved metal sample: Antimony, arsenic, boron, cadmium, chromium, copper, lead, manganese, mercury, zinc.	1 Ammonia, dissolved oxygen, pH, nitrite/nitrate, total nitrogen, total phosphorus, and total Kjeldahl nitrogen	1 *E. coli* bacteria 1 Suspended sediment concentration 1 Turbidity

EXCEEDANCES

POLLUTANT	STANDARD UNIT DESIGNATED USES	DATES EXCEEDANCES	DESIGNATED USE SUPPORT SUPPORTING EVIDENCE AND COMMENTS
No Exceedances			

Pollutant: Assume "total" concentration, unless shown as dissolved.
Frequency Exceed = Samples collected within a 7-day period are aggregated and counted as one sample (see assessment methods).

DATA GAPS AND MONITORING NEEDS

EXCEEDANCES NEEDING MORE SAMPLES TO ASSESS	MISSING CORE PARAMETERS	MISSING SEASONAL DISTRIBUTION	DETECTION LIMITS NOT LOW ENOUGH
	Insufficient core parameters	Insufficient monitoring events	
MONITORING RECOMMENDATIONS		Low Priority – Collect core parameters to represent at least 3 seasons during the assessment period.	

EAST VERDE RIVER From headwaters to Ellison Creek 15060203 – 022A 8.1 miles	USE SUPPORT	OVERALL ASSESSMENT	
	A&Wc – Inconclusive FBC – Attaining FC – Inconclusive DWS – Inconclusive AgI – Attaining AgL – Inconclusive	Category 2 Attaining some uses	

MONITORING USED IN THIS ASSESSMENT

SITE NAMES ID # DATABASE #	AGENCY PURPOSE	SAMPLING PERIOD: 11/24/2003 – 05/03/2004 NUMBER AND TYPES OF SAMPLES		
		Metals	Nutrients – Related	Other
Above 2nd Crossing VREVR045.50 100786	ADEQ Fixed site	3 dissolved and total: Antimony, arsenic, beryllium, boron, cadmium, chromium, copper, manganese, zinc 3 total only: Chromium 2 total and 3 dissolved: Copper, mercury, lead	3 Ammonia, dissolved oxygen, pH, nitrite/nitrate, 2 Total nitrogen, total phosphorus, and total Kjeldahl nitrogen	3 *E. coli* bacteria 3 fluoride 3 suspended sediment concentration, 3 turbidity, 3 total dissolved solids

EXCEEDANCES

POLLUTANT	STANDARD UNIT DESIGNATED USES	DATES EXCEEDANCES	DESIGNATED USE SUPPORT SUPPORTING EVIDENCE AND COMMENTS
Dissolved oxygen	7.0 mg/L A&Wc	05/03/2004 – 6.4 mg/L	Inconclusive – 1 of 3 dissolved oxygen samples did not meet standards at 6.4 mg/L. (Binomial) (This is only slightly below the standard and is likely due to natural conditions and groundwater upwelling.)

Pollutant: Assume "total" concentration, unless shown as dissolved.
Frequency Exceed = Samples collected within a 7-day period are aggregated and counted as one sample per site.

DATA GAPS AND MONITORING NEEDS

EXCEEDANCES NEEDING MORE SAMPLES TO ASSESS	MISSING CORE PARAMETERS	MISSING SEASONAL DISTRIBUTION	DETECTION LIMITS NOT LOW ENOUGH
Dissolved oxygen	Insufficient copper, lead, mercury, nitrogen, and phosphorus are needed to assess AgL, FC, A&W, and DWS		Lab detection limit for selenium higher than the A&W chronic criterion.
MONITORING RECOMMENDATIONS		Medium Priority – Collect dissolved oxygen due low dissolved oxygen concentration in one sample. Collect missing core parameters to represent at least 3 seasons during an assessment period. Use lower lab detection limit for selenium samples.	

EAST VERDE RIVER From Ellison Creek to American Gulch 15060203 – 022B 20.3	USE SUPPORT	OVERALL ASSESSMENT	POLLUTANTS CAUSING IMPAIRMENT	IMPAIRMENT STATUS
	A&Ww – Impaired FBC – Attaining FC – Attaining DWS – Attaining AgI – Attaining AgL – Attaining	Category 5 Impaired	Selenium	Selenium listed in 2004

MONITORING USED IN THIS ASSESSMENT

SITE NAMES ID # DATABASE #	AGENCY PURPOSE	SAMPLING PERIOD: 02/01/2000 – 05/31/2005 NUMBER AND TYPES OF SAMPLES		
		Metals	Nutrients – Related	Other
Below Hwy 87 Bridge near Payson VREVR034.80 100474	ADEQ Fixed site	6-23 dissolved and total: Antimony, arsenic, barium, beryllium, boron, cadmium, chromium, copper, lead, manganese, mercury, nickel, silver, thallium, and zinc. 1 Selenium	21-22 Ammonia, dissolved oxygen, pH, nitrite/nitrate, total nitrogen, total phosphorus, and total Kjeldahl nitrogen	18 *E. coli* bacteria 22 Fluoride 12 Suspended sediment concentration, 17 Turbidity, 21 Total dissolved solids

EXCEEDANCES

POLLUTANT	STANDARD UNIT DESIGNATED USES	DATES EXCEEDANCES	DESIGNATED USE SUPPORT SUPPORTING EVIDENCE AND COMMENTS
Selenium	2.0 µg/L A&Ww chronic	01/18/2001 – 5.3 µg/L	Remains impaired – 1 exceedance during the assessment period. Lab detection limit for other samples were higher than chronic criteria so could not be used to determine attainment.
Mercury	0.6 µg/L FC	4/17/2002 – 1.2 µg/L	Attaining – Only 1 exceedance in 11 sampling events. (Binomial)

Pollutant: Assume "total" concentration, unless shown as dissolved.
Frequency Exceed = Samples collected within a 7-day period are aggregated and counted as one sample per site.

DATA GAPS AND MONITORING NEEDS

EXCEEDANCES NEEDING MORE SAMPLES TO ASSESS	MISSING CORE PARAMETERS	MISSING SEASONAL DISTRIBUTION	DETECTION LIMITS NOT LOW ENOUGH
Selenium	All core parameters collected		Lab detection limits for selenium and dissolved mercury were higher than A&W chronic criteria.
MONITORING RECOMMENDATIONS		High Priority – Data needed to support selenium TMDL development. Use lower lab detection limits for selenium and dissolved mercury samples. Note that the old turbidity standard (50 NTU) was exceeded in 2 of 21 samples (56 and 97 NTU). Recommend using biocriteria assessments and bottom deposits implementation procedures in this reach, when they are adopted.	

EAST VERDE RIVER From American Gulch to Verde River 15060203 – 022C 25.8 miles	USE SUPPORT	OVERALL ASSESSMENT	POLLUTANTS CAUSING IMPAIRMENT	IMPAIRMENT STATUS
	A&Ww – Attaining FBC – Impaired FC – Attaining DWS – Impaired AgI – Impaired AgL – Impaired	Category 5 Impaired	Arsenic, Boron	Adding arsenic and boron to the 303(d) List

MONITORING USED IN THIS ASSESSMENT

SITE NAMES ID # DATABASE #	AGENCY PURPOSE	SAMPLING PERIOD: 01/26/2000 – 06/09/2005 NUMBER AND TYPES OF SAMPLES		
		Metals	Nutrients – Related	Other
Near Childs 15060203-022C VREVR002.62 100739	USGS Fixed site	18-19 samples of dissolved and total metals: Antimony, arsenic, beryllium, boron, cadmium, chromium, copper, lead, manganese, nickel, selenium, silver, thallium, zinc. 19 total metals only: Mercury	18-19 samples: Ammonia, dissolved oxygen, pH, nitrite/nitrate, total nitrogen, total phosphorus, and total Kjeldahl nitrogen	18 *E. coli* bacteria 19 Fluoride 19 Suspended sediment concentration, 18 Turbidity, 19 Total dissolved solids

EXCEEDANCES

POLLUTANT	STANDARD UNIT DESIGNATED USES	DATES EXCEEDANCES	DESIGNATED USE SUPPORT SUPPORTING EVIDENCE AND COMMENTS
Arsenic	50 µg/L – DWS, FBC 200 µg/L – AgL	05/30/2000 – 100 µg/L 09/27/2000 – 120 µg/L 03/26/2002 – 51 µg/L 06/26/2002 – 394 µg/L 08/28/2002 – 326 µg/L 10/29/2002 – 127 µg/L 06/25/2003 – 226 µg/L 08/27/2003 – 200 µg/L 10/29/2003 – 202 µg/L 03/29/2004 – 58 µg/L 06/24/2004 – 390 µg/L 08/27/2004 – 168 µg/L	Impaired – Exceeded 50 µg/L criterion in 12 of 22 samples. Magnitude of exceedance should also be noted. High arsenic concentrations may be due to natural conditions. Note that exceedances occur when flow is less than 5 cfs.
Boron	630 µg/L – DWS 1000 µg/L – AgI	05/30/2000 – 1000 µg/L 06/26/2002 – 1730 µg/L 08/28/2002 – 1630 µg/L 10/29/2002 – 756 µg/L 06/25/2003 – 1270 µg/L 08/27/2003 – 969 µg/L 10/29/2003 – 959 µg/L 06/24/2004 – 1890 µg/L 08/27/2004 – 642 µg/L	Impaired-- 9 of 22 samples exceeded the 630 µg/L criterion. Magnitude of exceedances should also be noted. High boron levels also occur when flow is less than 5 cfs.
Dissolved oxygen	6.0 mg/L A&Ww	05/30/2000 – 5.6 mg/L 08/27/2004 - 5.5 mg/L	Attaining – Low dissolved oxygen due to natural conditions with low flows and ground water upwelling.
E. coli bacteria	235 CFU/100 ml FBC	08/27/2003 – 270 CFU/100 ml	Inconclusive – Only 1 exceedance during the last 3 years of monitoring. The exceedance is below ADEQ's screening value of 300 CFU/100 ml. The screening value is used for impairment decisions rather than the standard because laboratories provide an estimate of bacteria density.

Pollutant: Assume "total" concentration, unless shown as dissolved.
Frequency Exceed = Samples collected within a 7-day period are aggregated and counted as one sample per site.

DATA GAPS AND MONITORING NEEDS			
EXCEEDANCES NEEDING MORE SAMPLES TO ASSESS	**MISSING CORE PARAMETERS**	**MISSING SEASONAL DISTRIBUTION**	**DETECTION LIMITS NOT LOW ENOUGH**
Boron and *E. coli* bacteria	**All core parameters collected.**		Lab detection limit for dissolved mercury was higher than the A&Ww chronic criterion.
MONITORING RECOMMENDATIONS		High Priority – Collect boron and arsenic samples to support TMDL development. Collect *E. coli* bacteria samples due to the exceedance. Use lower lab detection limits for dissolved mercury.	

FOSSIL CREEK From headwaters to Verde River 15060203 – 024 19.9 miles	USE SUPPORT	OVERALL ASSESSMENT	
	A&Ww – Attaining FBC – Attaining FC – Attaining AgL – Attaining	Category 1 Attaining all uses	

MONITORING USED IN THIS ASSESSMENT

SITE NAMES ID # DATABASE #	AGENCY PURPOSE	SAMPLING PERIOD: 08/15/2003 – 08/11/2004 NUMBER AND TYPES OF SAMPLES Metals	Nutrients – Related	Other
Above sunfish barrier VRFOS015.22 102852	AGFD Ambient	4 - 9 dissolved and total samples: Antimony, arsenic, boron, cadmium, chromium, copper, lead, zinc 4-9 total and 0-1 dissolved: Beryllium, manganese, and mercury	8-10 samples: Ammonia, dissolved oxygen, pH, total nitrogen, nitrite/nitrate, and total Kjeldahl nitrogen 5 samples: Phosphorus	4 *E. coli* bacteria 9 Fluoride 4 Suspended sediment concentration, 5 Turbidity, 9 Total dissolved solids
Below Irvine Power Plant VRFOS013.98 102766	AGFD Ambient			
Above Irvine Power Plant VRFOS010.73 102764	AGFD Ambient			
Above Salley Mae Wash VRFOS007.36 100785	ADEQ Ambient			
Below Salley Mae Wash VRFOS007.62 102765	AGFD Ambient			

EXCEEDANCES

POLLUTANT	STANDARD UNIT DESIGNATED USES	DATES EXCEEDANCES	DESIGNATED USE SUPPORT SUPPORTING EVIDENCE AND COMMENTS
No Exceedances			

Pollutant: Assume "total" concentration, unless shown as dissolved.
Frequency Exceed = Samples collected within a 7-day period are aggregated and counted as one sample per site.

DATA GAPS AND MONITORING NEEDS

EXCEEDANCES NEEDING MORE SAMPLES TO ASSESS	MISSING CORE PARAMETERS	MISSING SEASONAL DISTRIBUTION	DETECTION LIMITS NOT LOW ENOUGH
	Collected all core parameters	.	Lab detection limit for selenium was higher than A&W chronic criterion
MONITORING RECOMMENDATIONS		Low Priority – Use a lower lab detection limit for selenium.	

GAP CREEK From Government Springs to Verde River 15060203 – 774B 5.4 Miles	USE SUPPORT	OVERALL ASSESSMENT	
	A&Ww – Attaining FBC – Attaining FC – Attaining AgL – Attaining	Category 1 Attaining all uses	

MONITORING USED IN THIS ASSESSMENT

SITE NAMES ID # DATABASE #	AGENCY PURPOSE	SAMPLING PERIOD: 10/01/2003 – 04/27/2004 NUMBER AND TYPES OF SAMPLES		
		Metals	Nutrients – Related	Other
One-half mile above Salt Mine Road VRGAP000.92 100557	ADEQ Fixed site	3-4 dissolved and total samples: Antimony, arsenic, beryllium, cadmium, copper, lead, mercury, manganese, zinc. 4 total metals only: Boron, chromium, manganese	4 Ammonia, dissolved oxygen, pH, nitrite/nitrate, total nitrogen, total phosphorus, and total Kjeldahl nitrogen	4 *E. coli* bacteria 4 Fluoride 4 Suspended sediment concentration, 4 Turbidity, 4 Total dissolved solids

EXCEEDANCES

POLLUTANT	STANDARD UNIT DESIGNATED USES	DATES EXCEEDANCES	DESIGNATED USE SUPPORT SUPPORTING EVIDENCE AND COMMENTS
No Exceedances			

Pollutant: Assume "total" concentration, unless shown as dissolved.
Frequency Exceed = Samples collected within a 7-day period are aggregated and counted as one sample per site.

DATA GAPS AND MONITORING NEEDS

EXCEEDANCES NEEDING MORE SAMPLES TO ASSESS	MISSING CORE PARAMETERS	MISSING SEASONAL DISTRIBUTION	DETECTION LIMITS NOT LOW ENOUGH
	All core parameters collected		Lab detection limit for selenium was higher than A&W chronic criterion.
MONITORING RECOMMENDATIONS		Low Priority – Use a lower lab detection limit for selenium samples .	

GRANITE BASIN LAKE 15060202 – 0580 7 Acres	USE SUPPORT	OVERALL ASSESSMENT	
	A&Ww – Inconclusive FBC – Inconclusive FC – Attaining AgI – Inconclusive AgL – Inconclusive	Category 2 Attaining some uses	

MONITORING USED IN THIS ASSESSMENT

SITE NAMES ID # DATABASE #	AGENCY PURPOSE	SAMPLING PERIOD: 01/28/2002 – 03/08/2004 NUMBER AND TYPES OF SAMPLES		
		Metals	Nutrients – Related	Other
At Dam VRGLB-A 100024	ADEQ Ambient	3-5 samples of dissolved and total metals: Antimony, arsenic, barium beryllium, boron, cadmium, chromium, copper, lead, manganese, nickel, selenium, silver, zinc. 5 total mercury (no dissolved)	5 samples: Ammonia, dissolved oxygen, pH, nitrite/nitrate, total nitrogen, total phosphorus, and total Kjeldahl nitrogen	4 *E. coli* bacteria 5 Fluoride 5 Turbidity, 4 Total dissolved solids
At Boat Ramp VRGLB-BR 101398	ADEQ Ambient			

EXCEEDANCES

POLLUTANT	STANDARD UNIT DESIGNATED USES	DATES EXCEEDANCES	DESIGNATED USE SUPPORT SUPPORTING EVIDENCE AND COMMENTS
Ammonia	4.6 at pH 7.2 and water temperature 17.2 A&Ww chronic	08/28/2002 – 7.65 mg/L	Inconclusive – Only 1 exceedance during the last 3 years of monitoring. (1 of 5 sampling events.)
Arsenic	50 µg/L FBC	08/28/2002 – 60 µg/L	Inconclusive –1 of 6 samples exceeded the arsenic criterion of 50 µg/L. (Binomial)
Dissolved oxygen	6.0 mg/L A&Ww	08/28/2002 – 3.63 mg/L	Attaining – Low dissolved oxygen due to natural conditions during lake "turn over."
Manganese	10,000 µg/L AgI	08/28/2002 – 12,000 µg/L	Inconclusive – Only 1 of 6 samples exceeded criterion. (Binomial)
pH	<9.0 SU A&Ww, AgI, AgL, FBC	05/22/2002 – 9.3 SU	Inconclusive – Only 1 of 6 samples exceeded criterion (Binomial)

Pollutant: Assume "total" concentration, unless shown as dissolved.
Frequency Exceed = Samples collected within a 7-day period are aggregated and counted as one sample per site.

DATA GAPS AND MONITORING NEEDS

EXCEEDANCES NEEDING MORE SAMPLES TO ASSESS	MISSING CORE PARAMETERS	MISSING SEASONAL DISTRIBUTION	DETECTION LIMITS NOT LOW ENOUGH
Ammonia, arsenic, dissolved oxygen, manganese, pH	All core parameters collected.		Lab detection limit for dissolved mercury was higher than the A&Ww chronic criterion.
MONITORING RECOMMENDATIONS		Medium Priority – Collect arsenic, manganese, and pH samples due to exceedances. Low dissolved oxygen and elevated pH may be symptoms of excess nutrient loading. New methods for implementing the narrative nutrient standard should be applied to this lake once adopted, to determine whether narrative nutrient violations are occurring. Use a lower lab detection limit for dissolved mercury.	

GRANITE CREEK From headwaters to Willow Creek 15060202 – 059A 13.4 Miles	USE SUPPORT		OVERALL ASSESSMENT	POLLUTANTS CAUSING IMPAIRMENT	IMPAIRMENT STATUS
	A D E Q	A&Wc – Inconclusive FBC – Inconclusive FC – Inconclusive AgI -- Inconclusive AgL – Inconclusive	Category 3 Inconclusive		
	E P A	A&Wc – Impaired (Affected use only)	Category 5 Impaired	Dissolved oxygen	EPA listed dissolved oxygen in 2004

Light blue highlights indicate EPA impairments based on EPA assessment and listing criteria. This listing may change when EPA reviews and approves the 2006 impaired waters list. Such listings do not satisfy requirements established in Arizona's Impaired Water Identification Rule; therefore, they are not included in the list of Arizona's impaired waters (Appendix B and Appendix C).

MONITORING USED IN THIS ASSESSMENT

SITE NAMES ID # DATABASE #	AGENCY PURPOSE	SAMPLING PERIOD: 04/10/2000 – 02/13/2003 NUMBER AND TYPES OF SAMPLES		
		Metals	Nutrients – Related	Other
At Prescott, AZ VRGRA029.64 USGS #09502960 101580	USGS Ambient	3-4 dissolved samples only: Arsenic, barium, beryllium, boron, chromium, copper, manganese, selenium, silver, zinc. 1 or 2 dissolved metals: Antimony, lead, mercury, silver. No total metals and dis. cadmium.	0 total nutrients (all were dissolved only)	4 *E. coli* bacteria 2 Susp. sediment conc 1 Total dissolved solids 4 Pesticides 4 VOCs (solvents) 4 Petroleum products
Above Watson Lake VRGRA028.50 102565	AGFD Special investigation			

EXCEEDANCES

POLLUTANT	STANDARD UNIT DESIGNATED USES	DATES EXCEEDANCES	DESIGNATED USE SUPPORT SUPPORTING EVIDENCE AND COMMENTS
Dissolved oxygen	7.0 mg/L A&Wc	07/16/2000 – 6.2 mg/L	Inconclusive –1 exceedance in 4 sampling events.
E. coli bacteria	235 CFU/100 ml FBC	04/10/2000 – 240 CFU/100 ml 08/25/2000 – GT 04/11/2001 – 300 CFU/100 ml	Inconclusive – 3 exceedances, but only one of them was above the screening value of 300 CFU/100 ml. (Note GT = greater than lab detection limit)
Mercury (dissolved)	0.01 µg/L Chronic A&Wc	08/25/2000 – 0.3 µg/L	Inconclusive – Only one exceedance. Laboratory detection limits were above standards in other samples.

Pollutant: Assume "total" concentration, unless shown as dissolved.
Frequency Exceed = Samples collected within a 7-day period are aggregated and counted as one sample per site.

DATA GAPS AND MONITORING NEEDS

EXCEEDANCES NEEDING MORE SAMPLES TO ASSESS	MISSING CORE PARAMETERS	MISSING SEASONAL DISTRIBUTION	DETECTION LIMITS NOT LOW ENOUGH
E. coli bacteria, dissolved mercury,	Insufficient core parameters	Insufficient sampling events.	Laboratory detection limit for dissolved mercury were higher than water quality standards.
DISCUSSION OF LOW DISSOLVED OXYGEN IMPAIRMENT		Evidence of potential impairment: 1. Elevated nitrogen at the time of low DO; 2. One low dissolved oxygen in four samples; and 3. Stream is intermittent and low dissolved oxygen may be due groundwater upwelling or other natural conditions.	
MONITORING RECOMMENDATIONS		High Priority – Collect dissolved oxygen data to support TMDL development. Collect *E. coli* and dissolved mercury data due to exceedances. Collect core parameters to represent at least 3 seasons. Use a lower lab detection limit for dissolved mercury.	

HORSESHOE RESERVOIR 15060203 – 0620 1980 Acres	USE SUPPORT	OVERALL ASSESSMENT	
	A&Ww – Inconclusive FBC – Inconclusive FC – Inconclusive AgI -- Inconclusive AgL – Inconclusive	Category 3 Inconclusive	

MONITORING USED IN THIS ASSESSMENT

SITE NAMES ID # DATABASE #	AGENCY PURPOSE	SAMPLING PERIOD: 09/23/2004 NUMBER AND TYPES OF SAMPLES		
		Metals	Nutrients – Related	Other
At boat ramp VRHSR-BR 102758	ADEQ Fixed site		1 Ammonia, dissolved oxygen, pH, nitrite/nitrate, total nitrogen, total phosphorus, and total Kjeldahl nitrogen	1 Turbidity, 1 Total dissolved solids

EXCEEDANCES

POLLUTANT	STANDARD UNIT DESIGNATED USES	DATES EXCEEDANCES	DESIGNATED USE SUPPORT SUPPORTING EVIDENCE AND COMMENTS
Dissolved oxygen	6 mg/L A&Ww	09/23/2004 – 2.8 mg/L	Inconclusive – Only 1 sample, but result well below required minimum concentration.

Pollutant: Assume "total" concentration, unless shown as dissolved.
Frequency Exceed = Samples collected within a 7-day period are aggregated and counted as one sample per site.

DATA GAPS AND MONITORING NEEDS

EXCEEDANCES NEEDING MORE SAMPLES TO ASSESS	MISSING CORE PARAMETERS	MISSING SEASONAL DISTRIBUTION	DETECTION LIMITS NOT LOW ENOUGH
Dissolved oxygen	Insufficient core parameters	Insufficient monitoring events.	
MONITORING RECOMMENDATIONS		Medium Priority – Collect more dissolved oxygen samples due to exceedance. Note that the old turbidity standard (25 NTU) was exceeded in the 1 sample (09/23/2994 at 179 NTU). Turbidity and low dissolved oxygen may be symptoms of excess nutrient loading. New methods for implementing the narrative nutrient standard should be applied to this lake once adopted, to determine whether narrative nutrient violations are occurring. Collect core parameters to represent at least 3 seasons during an assessment period.	

JD DAM LAKE 15060202 – 0700 28 Acres	USE SUPPORT	OVERALL ASSESSMENT	
	A&Wc – Inconclusive FBC – Inconclusive FC – Attaining AgI – Attaining AgL – Attaining	Category 2 Attaining some uses	

MONITORING USED IN THIS ASSESSMENT

SITE NAMES ID # DATABASE #	AGENCY PURPOSE	SAMPLING PERIOD: 06/21/2001 – 10/31/2001 NUMBER AND TYPES OF SAMPLES		
		Metals	Nutrients – Related	Other
At Dam VRJDD-A 101286	ADEQ Ambient	4 total metal samples only: Antimony, arsenic, barium, beryllium, boron, cadmium, chromium, copper, lead, manganese, mercury, nickel, selenium, silver, zinc.	4 samples: Ammonia, dissolved oxygen, pH, nitrite/nitrate, total nitrogen, total phosphorus, and total Kjeldahl nitrogen	1 *E. coli* bacteria 4 Turbidity 4 Total dissolved solids
Mid Lake VRJDD-B 102549	ADEQ Ambient			
At Boat Ramp VRJDD-BR 101318	ADEQ Ambient			

EXCEEDANCES

POLLUTANT	STANDARD UNIT DESIGNATED USES	DATES EXCEEDANCES	DESIGNATED USE SUPPORT SUPPORTING EVIDENCE AND COMMENTS
No Exceedances			

Pollutant: Assume "total" concentration, unless shown as dissolved.
Frequency Exceed = Samples collected within a 7-day period are aggregated and counted as one sample per site.

DATA GAPS AND MONITORING NEEDS

EXCEEDANCES NEEDING MORE SAMPLES TO ASSESS	MISSING CORE PARAMETERS	MISSING SEASONAL DISTRIBUTION	DETECTION LIMITS NOT LOW ENOUGH
	Insufficient *E. coli* bacteria and dissolved metals (cadmium, copper, and zinc) assess A&Ww and FBC.		
MONITORING RECOMMENDATIONS		Low Priority – Collect missing core parameters to represent at least 3 seasons. Note that the old turbidity standard (10 NTU) was exceeded in 1 of 4 samples (07/26/2001 at 23 NTU). Turbidity may be a symptom of excess nutrient loading. New methods for implementing the narrative nutrient standard should be applied to this lake once adopted, to determine whether narrative nutrient violations are occurring.	

MUNDS CREEK From headwaters to Oak Creek 15060202 – 415 17.0 Miles	USE SUPPORT	OVERALL ASSESSMENT	
	A&Ww – Attaining FBC – Attaining FC – Attaining	Category 1 Attaining all uses	

MONITORING USED IN THIS ASSESSMENT

SITE NAMES ID # DATABASE #	AGENCY PURPOSE	SAMPLING PERIOD: 08/12/2003 – 05/25/2005		
		NUMBER AND TYPES OF SAMPLES		
		Metals	Nutrients – Related	Other
At Indian Gardens VRMUN000.27 100500	ADEQ Ambient	3-5 Total and dissolved metal samples: Antimony, arsenic, barium, beryllium, cadmium, chromium, copper, lead, mercury, nickel, selenium, silver, zinc. 4 total metals only: Boron, manganese	4-5 samples: Ammonia, dissolved oxygen, pH, nitrite/nitrate, total nitrogen, total phosphorus, and total Kjeldahl nitrogen	5 *E. coli* bacteria 5 Suspended sediment concentration 4 Total dissolved solids

EXCEEDANCES

POLLUTANT	STANDARD UNIT DESIGNATED USES	DATES EXCEEDANCES	DESIGNATED USE SUPPORT SUPPORTING EVIDENCE AND COMMENTS
No Exceedances			

Pollutant: Assume "total" concentration, unless shown as dissolved.
Frequency Exceed = Samples collected within a 7-day period are aggregated and counted as one sample per site.

DATA GAPS AND MONITORING NEEDS

EXCEEDANCES NEEDING MORE SAMPLES TO ASSESS	MISSING CORE PARAMETERS	MISSING SEASONAL DISTRIBUTION	DETECTION LIMITS NOT LOW ENOUGH
	Collected all core parameters	All seasons were represented.	
MONITORING RECOMMENDATIONS		Low Priority – Collect samples during the next watershed cycle.	

OAK CREEK From headwaters to West Fork Oak Creek 15060202 – 019 7.4 Miles Unique Water	USE SUPPORT	OVERALL ASSESSMENT	POLLUTANTS CAUSING IMPAIRMENT	IMPAIRMENT STATUS
	A&Wc – Attaining FBC – Impaired FC – Attaining DWS – Attaining AgI -- Attaining AgL – Attaining	Category 5 Impaired	*E. coli* bacteria	Add to 303(d) List. Expand Phase II bacteria TMDL to include this reach of Oak Creek

MONITORING USED IN THIS ASSESSMENT

SITE NAMES ID # DATABASE #	AGENCY PURPOSE	SAMPLING PERIOD: 07/1/2003 – 01/11/2005 NUMBER AND TYPES OF SAMPLES		
		Metals	Nutrients – Related	Other
Below Sterling Springs Fish Hatchery VROAK 050.55 101882	ADEQ TMDL	3-5 dissolved and total samples: Antimony, arsenic, beryllium, cadmium, chromium, copper, lead, mercury, manganese, zinc. 4 total metals samples: Boron, manganese 1 total metals: Nickel	18-27 Ammonia, dissolved oxygen, pH, nitrite/nitrate, total nitrogen, total phosphorus, and total Kjeldahl nitrogen	26 *E. coli* bacteria 4 Fluoride 27 Suspended sediment concentration, 27 Turbidity, 4 Total dissolved solids
At Coconino County stage logger VROAK050.30 101863	ADEQ TMDL			
Below Pine Flats Subdivision VROAK049.28 101864	ADEQ TMDL			
Below Pine Flat Campground VROAK048.81 100607	ADEQ Ambient and TMDL			

EXCEEDANCES

POLLUTANT	STANDARD UNIT DESIGNATED USES	DATES EXCEEDANCES	DESIGNATED USE SUPPORT SUPPORTING EVIDENCE AND COMMENTS
E. coli bacteria	235 CFU/100 ml FBC	07/30/2003 – 517 CFU/100 ml 09/04/2004 – 1203 CFU/100 ml	Impaired – 2 exceedances during the last 3 years of monitoring
Dissolved oxygen	7 mg/L A&Wc	05/29/2004 – 6.2 mg/L	Attaining – Low dissolved oxygen in 1 of 12 sampling events. (Low DO occurred at two sites on that day.) (Binomial)
Suspended sediment concentration (SSC)	Geometric mean 80 mg/L A&Wc	01/11/2005 – 182 mg/L	Attaining – The 80 mg/L criterion was exceeded only in 1 of 26 samples. The geometric mean was not exceeded.

Frequency Exceed = Samples collected within a 7-day period are aggregated and counted as one sample per site.

DATA GAPS AND MONITORING NEEDS

EXCEEDANCES NEEDING MORE SAMPLES TO ASSESS	MISSING CORE PARAMETERS	MISSING SEASONAL DISTRIBUTION	DETECTION LIMITS NOT LOW ENOUGH
	Collected all core parameters	Collected samples during at least 3 seasons.	Lab detection limit for selenium was higher than the A&W chronic criterion.
MONITORING RECOMMENDATIONS		High Priority – Collect *E. coli* bacteria samples to support development of a TMDL. Use lower lab detection limit for selenium. Recommend using biocriteria assessments and bottom deposits implementation procedures in this reach, when they are adopted.	

OAK CREEK From West Fork Oak Creek to tributary at 345709/1114513 15060202 – 018A 5.0 Miles Unique Water	USE SUPPORT	OVERALL ASSESSMENT	POLLUTANTS CAUSING IMPAIRMENT	IMPAIRMENT STATUS
	A&Wc – Attaining FBC – Impaired FC – Attaining DWS – Attaining AgI -- Attaining AgL – Attaining	Category 5 Impaired	*E. coli* bacteria	Add to 303(d) List. Expand Phase II bacteria TMDL to include this reach of Oak Creek.

MONITORING USED IN THIS ASSESSMENT

SITE NAMES ID # DATABASE #	AGENCY PURPOSE	SAMPLING PERIOD: 07/01/2003 – 07/05/2005 NUMBER AND TYPES OF SAMPLES		
		Metals	Nutrients – Related	Other
Above Bootlegger Campground VROAK046.10 101866	ADEQ TMDL	3-4 total and dissolved metals: samples: Chromium, copper 3-4 total and 0-2 dissolved: Arsenic, boron, lead, manganese, mercury 1 total and dissolved: Antimony 1 total, 3 dissolved: Cadmium, zinc	10-11 samples: ammonia, nitrite/nitrate, and total Kjeldahl nitrogen, total phosphorus 28 samples: Dissolved oxygen and pH	25 *E. coli* bacteria 3 Fluoride 26 Suspended sediment concentration, 28 Turbidity,
At Banjo Bill Campground VROAK044.98 101867	ADEQ TMDL			
Above Slide Rock State Park VROAK044.46 101869	ADEQ TMDL			

EXCEEDANCES

POLLUTANT	STANDARD UNIT DESIGNATED USES	DATES EXCEEDANCES	DESIGNATED USE SUPPORT SUPPORTING EVIDENCE AND COMMENTS
E. coli bacteria	235 CFU/100 ml FBC	07/30/2003 – 1733 CFU/100 ml 09/04/2004 – 517 CFU/100 ml 07/02/2005 – 517 CFU/100 ml	Impaired – 3 exceedances during the last 3 years of monitoring
Dissolved oxygen	7 mg/L A&Wc	05/29/2004 – 6.1 mg/L 07/02/2005 – 6.7 mg/L	Attaining – Low dissolved oxygen is due to natural conditions of low flow and groundwater upwelling. Low nutrient levels on two dates with low DO.

Frequency Exceed = Samples collected within a 7-day period are aggregated and counted as one sample per site.

DATA GAPS AND MONITORING NEEDS

EXCEEDANCES NEEDING MORE SAMPLES TO ASSESS	MISSING CORE PARAMETERS	MISSING SEASONAL DISTRIBUTION	DETECTION LIMITS NOT LOW ENOUGH
	Collected all core parameters	None	Lab detection limits for selenium was higher than the A&Wc chronic criteria.
MONITORING RECOMMENDATIONS		High Priority – Collect *E. coli* bacteria samples to support TMDL development. Use lower lab detection limits for selenium.	

OAK CREEK From tributary at 345709 / 1114513 to downstream boundary of Slide Rock State Park 15060202 – 018B 1 Mile Unique Water	USE SUPPORT	OVERALL ASSESSMENT	POLLUTANTS CAUSING IMPAIRMENT	IMPAIRMENT STATUS
	A&Ww – Attaining FBC – Impaired FC – Attaining DWS – Attaining AgI -- Attaining AgL – Attaining	Category 5 Impaired	*E. coli* bacteria	Phase II TMDL being developed.

MONITORING USED IN THIS ASSESSMENT

SITE NAMES ID # DATABASE #	AGENCY PURPOSE	SAMPLING PERIOD: 01/09/2000 – 07/05/2005 NUMBER AND TYPES OF SAMPLES Metals	Nutrients – Related	Other
Above Slide Rock VROAK044.04 101868	ADEQ TMDL & Friends of the Forest	3-5 total and dissolved: Chromium, copper, 3-5 total metals only: Arsenic, boron, lead, manganese, mercury, zinc 3-5 dissolved metals only: cadmium, zinc 0-1 total and 0-1 dissolved: Antimony, arsenic, beryllium, cadmium, lead, mercury, and zinc	15-22 samples: Ammonia, total nitrogen, nitrite/nitrate, total Kjeldahl nitrogen, total phosphorus, dissolved oxygen. and pH	938 *E. coli* bacteria 3 Fluoride 17 Suspended sediment concentration, 22 Turbidity,
Upstream of Slide VROAK043.88 102695	ADEQ TMDL & State Park Ambient			
Mid Slide VROAK043.83 102694	ADEQ TMDL & State Park Ambient			
Large Pool at Slide VROAK043.81 102693	ADEQ TMDL & State Park Ambient			
At Foot Bridge VROAK043.79 102692	ADEQ TMDL & State Park Ambient			
At Highway Bridge VROAK043.73 100609	ADEQ TMDL & State Park Ambient			
Below Slide Rock VROAK042.86 101870	ADEQ TMDL & State Park Ambient			

EXCEEDANCES

POLLUTANT	STANDARD UNIT DESIGNATED USES	DATES EXCEEDANCES	DESIGNATED USE SUPPORT SUPPORTING EVIDENCE AND COMMENTS
E. coli bacteria	235 CFU/100 ml FBC	Too many to list here.	Impaired – 58 exceedances (aggregating all sites within a 7-day period) during the assessment period. 20 exceedances in the last 3 years.
Suspended Sediment Concentration (SSC)	Geometric mean 80 mg/L A&Ww	03/10/2004 – 133 mg/L 01/11/2005 – 369 mg/L	Attaining – Although 2 exceedances of the 80 mg/L criterion, the geometric mean was not exceeded.

Frequency Exceed = Samples collected within a 7-day period are aggregated and counted as one sample (see assessment methods).

DATA GAPS AND MONITORING NEEDS

EXCEEDANCES NEEDING MORE SAMPLES TO ASSESS	MISSING CORE PARAMETERS	MISSING SEASONAL DISTRIBUTION	DETECTION LIMITS NOT LOW ENOUGH
None	Collected all core parameters		Lab detection limits for dissolved mercury and total selenium were higher than A&W chronic criteria.
MONITORING RECOMMENDATIONS		High Priority – Collect *E. coli* bacteria to support development of Phase II TMDL. Use lower lab detection limits for selenium and dissolved mercury. Recommend using biocriteria assessments and bottom deposits implementation procedures in this reach, when they are adopted.	

OAK CREEK From Slide Rock to Dry Creek 15060202 – 018C 20.0 Miles Unique Water	USE SUPPORT	OVERALL ASSESSMENT	POLLUTANTS CAUSING IMPAIRMENT	IMPAIRMENT STATUS
	A&Ww – Attaining FBC – Impaired FC – Attaining DWS – Attaining AgI -- Attaining AgL – Attaining	Category 5 Impaired	*E. coli* bacteria	Add to 303(d) List. Expand Phase II bacteria TMDL to include this reach on Oak Creek

MONITORING USED IN THIS ASSESSMENT

SITE NAMES ID # DATABASE #	AGENCY PURPOSE	SAMPLING PERIOD: 08/15/2001 – 07/05/2005 NUMBER AND TYPES OF SAMPLES		
		Metals	Nutrients – Related	Other
Below Manzanita Campground VROAK042.78 101871	ADEQ TMDL	7-22 total and dissolved samples: Antimony, arsenic , barium, beryllium, cadmium, chromium, copper, lead, silver, thallium, and zinc 21 total and 0-2 dissolved: Boron, manganese, and mercury	28-30 samples: Ammonia, total nitrogen, nitrite/nitrate, and total Kjeldahl nitrogen, total phosphorus 81 samples: Dissolved oxygen and pH	276 *E. coli* bacteria 20 Fluoride 63 Suspended sediment concentration, 75 Turbidity, 18 Total dissolved solids
Below Encinoso Picnic Area VROAK041.69 101872	ADEQ TMDL			
Below Rainbow Trout Farm VROAK039.92 101873	ADEQ TMDL			
At Ladders VROAK039.54 103111	Friends of the Forest Ambient			
At Crescent Moon VROAK0038.67 101876	Friends of the Forest Ambient			
Above Grasshopper Point VROAK038.52 101875	ADEQ TMDL			
Below Highway 179 VROAK035.79 100460	ADEQ TMDL			
At Chavez VROAK034.02 100461	ADEQ TMDL			
At Grasshopper Point VROAK031.52 101874	Friends of the Forest Ambient			
At Red Rock Crossing VROAK031.38 100926	ADEQ TMDL			

EXCEEDANCES			
POLLUTANT	**STANDARD UNIT DESIGNATED USES**	**DATES EXCEEDANCES**	**DESIGNATED USE SUPPORT SUPPORTING EVIDENCE AND COMMENTS**
E. coli bacteria	235 CFU/100 ml FBC	23 7-day periods with exceedances (Too many to list here)	Impaired – At least one exceedance in the 10 sites during 23 7-day periods. 276 samples were collected at all 10 sites to support a TMDL being developed.
Suspended sediment concentration (SSC)	Geometric mean 80 mg/L A&Ww	07/30/2003 – 514 mg/L 01/11/2005 – 166 mg/L 07/01/2005 – 253 mg/L	Attaining – Although there were 3 exceedances of the 80 mg/L criterion, the geometric mean of 4 consecutive samples was not exceeded.

Frequency Exceed = Samples collected within a 7-day period are aggregated and counted as one sample per site

DATA GAPS AND MONITORING NEEDS			
EXCEEDANCES NEEDING MORE SAMPLES TO ASSESS	**MISSING CORE PARAMETERS**	**MISSING SEASONAL DISTRIBUTION**	**DETECTION LIMITS NOT LOW ENOUGH**
None	**All core parameters collected.**		Lab detection limits for dissolved mercury and total selenium were higher than the A&W chronic criteria.
MONITORING RECOMMENDATIONS		High Priority – Collect *E. coli* bacteria samples to support TMDL development. Use lower lab detection limits for selenium and dissolved mercury. Recommend using biocriteria assessments and bottom deposits implementation procedures in this reach, when they are adopted	

OAK CREEK From Dry Creek to Spring Creek 15060202 – 017 10.0 Miles Unique Water	USE SUPPORT	OVERALL ASSESSMENT	POLLUTANTS CAUSING IMPAIRMENT	IMPAIRMENT STATUS
	A&Ww – Attaining FBC – Impaired FC – Attaining DWS – Attaining AgI -- Attaining AgL – Attaining	Category 5 Impaired	*E. coli* bacteria	Add to the 303(d) List. Expand Phase II bacteria TMDL to include this reach of Oak Creek

MONITORING USED IN THIS ASSESSMENT

SITE NAMES ID # DATABASE #	AGENCY PURPOSE	SAMPLING PERIOD: 01/10/2001 – 05/24/2005 NUMBER AND TYPES OF SAMPLES		
		Metals	Nutrients – Related	Other
Below Dry Creek VROAK022.58 101878	ADEQ TMDL	3-4 dissolved and total samples: Antimony, arsenic, beryllium, cadmium, chromium, copper, zinc 4 total and 0-2 dissolved: Boron, lead, manganese, mercury	7-9 samples: Ammonia, total nitrogen, nitrite/nitrate, and total Kjeldahl nitrogen, total phosphorus 12 samples: Dissolved oxygen and pH	102 *E. coli* bacteria 4 Fluoride 12 Suspended sediment concentration 12 Turbidity 4 Total dissolved solids
Below Page Springs VROAK016.70 100613	ADEQ TMDL			
At Mormon Crossing VROAK013.95 101880	Friends of the Forest TMDL			

EXCEEDANCES

POLLUTANT	STANDARD UNIT DESIGNATED USES	DATES EXCEEDANCES	DESIGNATED USE SUPPORT SUPPORTING EVIDENCE AND COMMENTS
E. coli bacteria	235 CFU/100 ml FBC	8/15/2001 – GT 10/21/2001 – 1348 CFU/100 ml 11/21/2001 – 1809 CFU/100 ml 12/07/2001 – 308 CFU/100 ml 09/11/2002 – 1011 CFU/100 ml 08/06/2003 – 921 CFU/100 ml 08/27/2003 – 613 CFU/100 ml 09/03/2003 – 830 CFU/100 ml 06/22/2004 – 687 CFU/100 ml 07/20/2004 – 461 CFU/100 ml 09/21/2004 – 613 CFU/100 ml 01/11/2005 – 365 CFU/100 ml	Impaired – The *E. coli* criterion was exceeded in 12 of 102 samples. Sampling was conducted to determine the extent of impairment on Oak Creek (upstream reach was already assessed as impaired 15060202-018B). (GT = "greater than," which is more colonies than could be counted)
Suspended sediment concentration (SSC)	Geometric mean 80 mg/L A&Ww	03/09/2004 – 144 mg/L 01/11/2005 – 460 mg/L	Attaining – Although 2 samples exceeded the 80 mg/L criterion, both exceedances occurred during high flows, so can not be included in the geometric mean calculation. Geometric mean was not exceeded.

Frequency Exceed = Samples collected within a 7-day period are aggregated and counted as one sample per site.

DATA GAPS AND MONITORING NEEDS

EXCEEDANCES NEEDING MORE SAMPLES TO ASSESS	MISSING CORE PARAMETERS	MISSING SEASONAL DISTRIBUTION	DETECTION LIMITS NOT LOW ENOUGH
	Collected all core parameters		Lab detection limits for dissolved mercury, dissolved lead, and total selenium were higher than the criteria.
MONITORING RECOMMENDATIONS		High Priority – Collect *E. coli* bacteria to support TMDL development. Use lower lab detection limits for dissolved mercury, lead, and total selenium. Recommend using biocriteria assessments and bottom deposits implementation procedures in this reach, when they are adopted	

OAK CREEK From Spring Creek to Verde River 15060202 – 016 12.7 Miles Unique Water	USE SUPPORT	OVERALL ASSESSMENT	
	A&Ww – Attaining FBC – Attaining FC – Attaining DWS – Attaining AgI -- Attaining AgL – Attaining	Category 1 Attaining all uses	

MONITORING USED IN THIS ASSESSMENT

SITE NAMES ID # DATABASE #	AGENCY PURPOSE	SAMPLING PERIOD: 08/11/2003 – 05/24/2005 NUMBER AND TYPES OF SAMPLES Metals	Nutrients – Related	Other
Above Cornville Bridge VROAK008.90 101881	ADEQ TMDL	3-4 dissolved and total samples: Antimony, arsenic, cadmium, chromium, copper, lead, zinc 4 total and 0-1 dissolved metals: Boron, manganese, and mercury	3-10 samples: Ammonia, total nitrogen, nitrite/nitrate, and total Kjeldahl nitrogen, total phosphorus, dissolved oxygen, and pH	10 *E. coli* bacteria 4 Fluoride 10 Suspended sediment concentration 10 Turbidity, 4 Total dissolved solids
Near Cornville VROAK000.21 USGS #09504500 100493	ADEQ Ambient			

EXCEEDANCES

POLLUTANT	STANDARD UNIT DESIGNATED USES	DATES EXCEEDANCES	DESIGNATED USE SUPPORT SUPPORTING EVIDENCE AND COMMENTS
Suspended sediment concentration (SSC)	Geometric mean 80 mg/L	03/08/2004 – 106 mg/L	Attaining – Exceeded 80 mg/L in one of 10 samples; however, exceedance was during a high flow event, so value could not be included in geometric mean calculation. Geometric mean did not exceed criterion.

Pollutant: Assume "total" concentration, unless shown as dissolved.
Frequency Exceed = Samples collected within a 7-day period are aggregated and counted as one sample per site.

DATA GAPS AND MONITORING NEEDS

EXCEEDANCES NEEDING MORE SAMPLES TO ASSESS	MISSING CORE PARAMETERS	MISSING SEASONAL DISTRIBUTION	DETECTION LIMITS NOT LOW ENOUGH
None	All core parameters collected.		Lab detection limits for dissolved mercury and total selenium were higher than the criteria.
MONITORING RECOMMENDATIONS		Low Priority – Use lower lab detection limits for selenium and dissolved mercury. Recommend using biocriteria assessments and bottom deposits implementation procedures in this reach, when they are adopted.	

PECKS LAKE 15060202 – 1060 95 Acres	USE SUPPORT	OVERALL ASSESSMENT	POLLUTANTS CAUSING IMPAIRMENT	IMPAIRMENT STATUS
	A&Wc – Impaired FBC – Attaining FC – Attaining AgI – Attaining AgL – Attaining	Category 4A Not attaining (Impaired)	Low dissolved oxygen and high pH.	TMDL approved in 2000.

MONITORING USED IN THIS ASSESSMENT

SITE NAMES ID # DATABASE #	AGENCY PURPOSE	SAMPLING DATES: 01/13/2000, 03/12/2002, 03/31/2004 NUMBER AND TYPES OF SAMPLES		
		Metals	Nutrients – Related	Other
At Dam VRPEC-AA 100511	ADEQ Ambient	3 total and 0-1 dissolved sample: Antimony, arsenic, barium, beryllium, boron, cadmium, chromium, copper, lead, manganese, mercury, nickel, selenium, silver, zinc	3: Ammonia, total nitrogen, nitrite/nitrate, and total Kjeldahl nitrogen, total phosphorus, dissolved oxygen, and pH	2 *E. coli* bacteria 3 Fluoride 3 Turbidity 3 Total dissolved solids
Mid Lake VRPEC-A 100063	ADEQ Ambient			
At Inlet VRPEC-F 100513	ADEQ Ambient			
At Verde River Inlet VRPEC-IN 100827	ADEQ Ambient			
East of Cement Bridge VRPEC-OUT 100828	ADEQ Ambient			

EXCEEDANCES

POLLUTANT	STANDARD UNIT DESIGNATED USES	DATES EXCEEDANCES	SUPPORTING EVIDENCE AND COMMENTS
Dissolved oxygen	7 mg/L A&Wc	01/13/2000 – 2.1 mg/L	Remains impaired – Insufficient data to change impairment status. (Binomial)

Frequency Exceed = Samples collected within a 7-day period are aggregated and counted as one sample per site.

DATA GAPS AND MONITORING NEEDS

EXCEEDANCES NEEDING MORE SAMPLES TO ASSESS	MISSING CORE PARAMETERS	MISSING SEASONAL DISTRIBUTION	DETECTION LIMITS NOT LOW ENOUGH
	Insufficient dissolved metals (cadmium, copper, and zinc) and *E. coli* bacteria to assess A&W and FBC.	Only 2 season represented (January and March samples)	Lab detection limit for dissolved mercury was above A&W chronic criterion.
MONITORING RECOMMENDATIONS		Medium Priority – Collect samples during critical conditions to determine the effectiveness of watershed improvements to reduce nutrient loadings. The old turbidity standard (10 NTU) was exceeded in 1 of 3 samples (16 NTU). Elevated turbidity and low dissolved oxygen may be symptoms of excess nutrient loading. New methods for implementing the narrative nutrient standard should be applied to this lake once adopted, to determine effectiveness of TMDL load reduction strategies. Collect core parameters during at least 3 seasons. Use a lower lab detection limit for dissolved mercury.	

PERKINS LAKE 15060202 – 1080 4 Acres	USE SUPPORT	OVERALL ASSESSMENT	
	A&Wc – Inconclusive FBC – Inconclusive FC – Inconclusive AgL – Inconclusive	Category 3 Inconclusive	

MONITORING USED IN THIS ASSESSMENT				
SITE NAMES ID # DATABASE #	AGENCY PURPOSE	SAMPLING PERIOD: 05/22/2001 – 09/06/2001		
		NUMBER AND TYPES OF SAMPLES		
		Metals	Nutrients – Related	Other
At Dam VRPER-A 101295	ADEQ Ambient	1-2 total metals samples:: Antimony, arsenic, barium, beryllium, boron, cadmium, chromium, copper, lead, manganese, nickel, selenium, silver, zinc (0 dissolved metals)	3 samples: Ammonia, total nitrogen, nitrite/nitrate, and total Kjeldahl nitrogen, and pH 2 Dissolved oxygen 1 Phosphorus	3 Fluoride 3 Turbidity 2 Total dissolved solids

EXCEEDANCES			
POLLUTANT	STANDARD UNIT DESIGNATED USES	DATES EXCEEDANCES	DESIGNATED USE SUPPORT SUPPORTING EVIDENCE AND COMMENTS
Dissolved oxygen	7 mg/L A&Wc	09/06/2001 – 6.2 mg/L 05/22/2001 – 4.6 mg/L	Inconclusive – Low dissolved oxygen in the top meter of the lake during both sampling events.

Pollutant: Assume "total" concentration, unless shown as dissolved.
Frequency Exceed = Samples collected within a 7-day period are aggregated and counted as one sample (see assessment methods).

DATA GAPS AND MONITORING NEEDS			
EXCEEDANCES NEEDING MORE SAMPLES TO ASSESS	MISSING CORE PARAMETERS	MISSING SEASONAL DISTRIBUTION	DETECTION LIMITS NOT LOW ENOUGH
Dissolved oxygen	Insufficient dissolved metals (cadmium, copper, and zinc) and *E. coli* bacteria to assess A&W and FBC.	Only 2 season represented (January and March samples)	
MONITORING RECOMMENDATIONS		Medium Priority – Collect additional dissolved oxygen data due to low measurements. Low dissolved oxygen may be a symptom of excess nutrient loading. New methods for implementing the narrative nutrient standard should be applied to this lake once adopted, to determine whether narrative nutrient violations are occurring. Collect core parameters to represent at least 3 seasons during an assessment period.	

RED CREEK From headwaters to Verde River 15060203 – 818 13.6 Miles	USE SUPPORT	OVERALL ASSESSMENT	
	A&Ww – Attaining FBC – Attaining FC – Attaining AgL – Attaining	Category 1 Attaining all uses	

MONITORING USED IN THIS ASSESSMENT

SITE NAMES ID # DATABASE #	AGENCY PURPOSE	SAMPLING PERIOD: 09/29/2003 – 04/28/2004 NUMBER AND TYPES OF SAMPLES		
		Metals	Nutrients – Related	Other
Above second road crossing VRRED004.17 100626	ADEQ Ambient	3-4 dissolved and total samples: Antimony, arsenic, beryllium, cadmium, copper, lead, manganese, mercury, zinc. 4 total metals samples only: Boron, chromium, manganese	3-4 Ammonia, dissolved oxygen, pH, nitrite/nitrate, total nitrogen, total phosphorus, and total Kjeldahl nitrogen	4 *E. coli* bacteria 4 Fluoride 4 Suspended sediment concentration, 4 Turbidity, 4 Total dissolved solids

EXCEEDANCES

POLLUTANT	STANDARD UNIT DESIGNATED USES	DATES EXCEEDANCES	DESIGNATED USE SUPPORT SUPPORTING EVIDENCE AND COMMENTS
No Exceedances			

Pollutant: Assume "total" concentration, unless shown as dissolved.
Frequency Exceed = Samples collected within a 7-day period are aggregated and counted as one sample (see assessment methods).

DATA GAPS AND MONITORING NEEDS

EXCEEDANCES NEEDING MORE SAMPLES TO ASSESS	MISSING CORE PARAMETERS	MISSING SEASONAL DISTRIBUTION	DETECTION LIMITS NOT LOW ENOUGH
None	All core parameters collected		Lab detection limit for selenium was higher than A&W chronic criteria.
MONITORING RECOMMENDATIONS		Low Priority – Use lower lab detection limits for selenium data.	

ROUNDTREE CANYON CREEK From headwaters to Tangle Creek 15060203 – 853 10.7 Miles	USE SUPPORT	OVERALL ASSESSMENT	
	A&Ww – Inconclusive FBC – Attaining FC – Attaining AgL – Attaining	Category 2 Attaining some uses	

MONITORING USED IN THIS ASSESSMENT

SITE NAMES ID # DATABASE #	AGENCY PURPOSE	SAMPLING PERIOD: 09/29/2003 – 04/28/2004		
		NUMBER AND TYPES OF SAMPLES		
		Metals	Nutrients – Related	Other
3 miles above Tangle Creek VRROU002.93 100631	ADEQ Fixed site	3-4 dissolved and total samples: Antimony, arsenic, beryllium, boron, cadmium, copper, lead, manganese, mercury, zinc. 4 total metals samples only: Boron, chromium, manganese samples	3-4 samples: Ammonia, dissolved oxygen, pH, nitrite/nitrate, total nitrogen, total phosphorus, and total Kjeldahl nitrogen	4 *E. coli* bacteria 4 Fluoride 4 Suspended sediment concentration, 4 Turbidity, 4 Total dissolved solids

EXCEEDANCES

POLLUTANT	STANDARD UNIT DESIGNATED USES	DATES EXCEEDANCES	DESIGNATED USE SUPPORT SUPPORTING EVIDENCE AND COMMENTS
Dissolved oxygen	6.0 mg/L A&Ww	09/29/2003 – 5.5 mg/L	Attaining – Exceedance due to natural conditions with flow less than 0.1 cfs and ground water upwelling the source of water.
Copper (dissolved)	18.9 µg/L at 240 mg/L hardness A&Ww chronic	01/27/2004 – 20 µg/L	Inconclusive – 1 exceedance during the assessment period.

Pollutant: Assume "total" concentration, unless shown as dissolved.
Frequency Exceed = Samples collected within a 7-day period are aggregated and counted as one sample per site.

DATA GAPS AND MONITORING NEEDS

EXCEEDANCES NEEDING MORE SAMPLES TO ASSESS	MISSING CORE PARAMETERS	MISSING SEASONAL DISTRIBUTION	DETECTION LIMITS NOT LOW ENOUGH
Copper	All core parameters collected		Lab detection limit for selenium was higher than the A&W chronic criterion.
MONITORING RECOMMENDATIONS		Medium Priority – Collect copper samples due to exceedances. Use a lower lab detection limit for selenium samples.	

SCHOLZE LAKE 15060202 – 1350 22 Acres	USE SUPPORT	OVERALL ASSESSMENT	
	A&Ww – Inconclusive FBC – Attaining FC – Attaining AgL – Attaining	Category 2 Attaining some uses	

MONITORING USED IN THIS ASSESSMENT

SITE NAMES ID # DATABASE #	AGENCY PURPOSE	SAMPLING DATES: 07/27/2001-6/20/2002 NUMBER AND TYPES OF SAMPLES		
		Metals	Nutrients – Related	Other
At Dam VRSCH-A 101295	ADEQ Ambient	3 total and 0-1 dissolved sample:: Antimony, arsenic, barium, beryllium, boron, cadmium, chromium, copper, lead, manganese, mercury, nickel, selenium, silver, zinc	4 samples: Ammonia, total nitrogen, nitrite/nitrate, and total Kjeldahl nitrogen, total phosphorus, dissolved oxygen, and Ph	1 *E. coli* bacteria 4 Fluoride 3 Turbidity 3 Total dissolved solids

EXCEEDANCES

POLLUTANT	STANDARD UNIT DESIGNATED USES	DATES EXCEEDANCES	DESIGNATED USE SUPPORT SUPPORTING EVIDENCE AND COMMENTS
Dissolved oxygen	6 mg/L A&Ww	10/29/2001 – 4.8 mg/L	Inconclusive – Low dissolved oxygen in 1 of 3 sampling events. (Binomial)

Pollutant: Assume "total" concentration, unless shown as dissolved.
Frequency Exceed = Samples collected within a 7-day period are aggregated and counted as one sample (see assessment methods).

DATA GAPS AND MONITORING NEEDS

EXCEEDANCES NEEDING MORE SAMPLES TO ASSESS	MISSING CORE PARAMETERS	MISSING SEASONAL DISTRIBUTION	DETECTION LIMITS NOT LOW ENOUGH
Dissolved oxygen	Insufficient dissolved metals (cadmium, copper, and zinc), total hardness, and *E. coli* bacteria to assess A&W and FBC.	Only 2 season represented (Sept-Oct and May samples)	Lab detection limits for dissolved metals (cadmium, copper, mercury, and silver) were higher than A&W chronic criteria.
MONITORING RECOMMENDATIONS		Medium Priority – Collect dissolved oxygen measurements due to the low dissolve oxygen. Collect core parameters during at least three different seasons during the assessment period. The old turbidity standard (25 NTU) was exceeded in 1 of 3 samples (09/07/2001 at 77 NTU). Low dissolved oxygen and elevated turbidity may be symptoms of excess nutrient loading. New methods for implementing the narrative nutrient standard should be applied to this lake once adopted, to determine whether narrative nutrient violations are occurring Use lower lab detection limits for dissolved metals.	

SPRING CREEK From Coffee Creek to Oak Creek 15060202 – 022 6.4 Miles	USE SUPPORT	OVERALL ASSESSMENT	POLLUTANTS CAUSING IMPAIRMENT	IMPAIRMENT STATUS
	A&Ww – Attaining FBC – Impaired FC – Attaining AgI -- Attaining AgL – Attaining	Category 5 Impaired	*E. coli* bacteria	Add to the 303(d) List. Expand Phase II bacteria TMDL to include this tributary to Oak Creek

MONITORING USED IN THIS ASSESSMENT

SITE NAMES ID # DATABASE #	AGENCY PURPOSE	SAMPLING PERIOD: 08/15/2001 – 01/11/2005 NUMBER AND TYPES OF SAMPLES		
		Metals	Nutrients – Related	Other
Above Willow Point Road VRSPN002.09 101879	Friends of the Forest Bacteria	3-4 dissolved and total samples: Antimony, arsenic, beryllium, cadmium, copper, lead, and zinc. 4 total metals and 0-2 dissolved metals: Boron, chromium, manganese, and mercury	3-7 samples: Total phosphorus, total Kjeldahl nitrogen, total nitrogen, nitrite/nitrate, ammonia, dissolved oxygen, and pH	97 *E. coli* bacteria 4 Fluoride 7 Suspended sediment concentration, 7 Turbidity, 4 Total dissolved solids
Near Road Crossing VRSPN002.04 100650	ADEQ Ambient TMDL			

EXCEEDANCES

POLLUTANT	STANDARD UNIT DESIGNATED USES	DATES EXCEEDANCES	DESIGNATED USE SUPPORT SUPPORTING EVIDENCE AND COMMENTS
E. coli bacteria	235 CFU/100 ml FBC	08/15/2001 – 3629 CFU/100 ml 10/10/2001 – 387 CFU/100 ml 07/31/2002 – 461 CFU/100 ml 08/21/2002 – 248 CFU/100 ml 08/28/2002 – 328 CFU/100 ml 09/11/2002 – 1011 CFU/100 ml 09/03/2003 – 308 CFU/100 ml 09/10/2003 – 548 CFU/100 ml 07/20/2004 – 291 CFU/100 ml	Impaired –7 exceedances during the last 3 years of monitoring (9 during the assessment period). Of these, 7 were above the 300 CFU/100 ml screening value.
Suspended sediment concentration (SSC)	Geometric mean 80 mg/L A&Ww	01/11/2005 – 310 mg/L	Attaining – 80 mg/L was exceeded in one sample; however, that sample was collected during a high flow event, so could not be included in the geometric mean calculation. Geometric mean standard was not exceeded.

Pollutant: Assume "total" concentration, unless shown as dissolved.
Frequency Exceed = Samples collected within a 7-day period are aggregated and counted as one sample (see assessment methods).

DATA GAPS AND MONITORING NEEDS

EXCEEDANCES NEEDING MORE SAMPLES TO ASSESS	MISSING CORE PARAMETERS	MISSING SEASONAL DISTRIBUTION	DETECTION LIMITS NOT LOW ENOUGH
	All core parameters collected		Lab detection limit for selenium and dissolved mercury were higher than the A&W chronic criteria.
MONITORING RECOMMENDATIONS		High Priority – Collect *E. coli* bacteria samples to support development of a TMDL. Use lower detection limits for selenium and dissolved mercury. Recommend using biocriteria assessments and bottom deposits implementation procedures in this reach, when they are adopted.	

STERLING CANYON From headwaters to Oak Creek 15060202 – 424 3.0 Miles	USE SUPPORT	OVERALL ASSESSMENT	
	A&Ww – Attaining FBC – Inconclusive FC – Inconclusive	Category 2 Attaining some uses	

MONITORING USED IN THIS ASSESSMENT

SITE NAMES ID # DATABASE #	AGENCY PURPOSE	SAMPLING DATES: 01/28/2004, 05/24/2005 NUMBER AND TYPES OF SAMPLES		
		Metals	Nutrients – Related	Other
Above Sterling Spring Hatchery VRSTC000.10 101923	ADEQ Ambient	1 dissolved and total metal samples: Cadmium, chromium, copper, lead, thallium, zinc 1 total metals only: Antimony, arsenic, barium, beryllium, boron, manganese, mercury, nickel, selenium	2-3 samples: Ammonia, dissolved oxygen, pH, nitrite/nitrate, total nitrogen, total phosphorus, and total Kjeldahl nitrogen	2 *E. coli* bacteria 1 Turbidity

EXCEEDANCE

POLLUTANT	STANDARD UNIT DESIGNATED USES	DATES EXCEEDANCES	DESIGNATED USE SUPPORT SUPPORTING EVIDENCE AND COMMENTS
Dissolved oxygen	6.0 mg/L A&Ww	05/24/2005 – 4.5 mg/L	Attaining – Low dissolved oxygen is naturally occurring due to low flow conditions and groundwater upwelling. Nutrients were very low.

Pollutant: Assume "total" concentration, unless shown as dissolved.
Frequency Exceed = Samples collected within a 7-day period are aggregated and counted as one sample (see assessment methods).

DATA GAPS AND MONITORING NEEDS

EXCEEDANCES NEEDING MORE SAMPLES TO ASSESS	MISSING CORE PARAMETERS	MISSING SEASONAL DISTRIBUTION	DETECTION LIMITS NOT LOW ENOUGH
	Insufficient core parameters	Insufficient sampling events	
MONITORING RECOMMENDATIONS		Low Priority – Collect core parameters to represent at least 3 seasons during an assessment period.	

STONEMAN LAKE 15060202 – 1490 125 Acres	USE SUPPORT	OVERALL ASSESSMENT	POLLUTANTS CAUSING IMPAIRMENT	IMPAIRMENT STATUS
	A&Wc – Impaired FBC – Inconclusive FC – Inconclusive AgI – Inconclusive AgL – Inconclusive	Category 4A Not attaining (Impaired)	Low dissolved oxygen and high pH	TMDL approved in 2000. Several watershed improvements completed.

MONITORING USED IN THIS ASSESSMENT

SITE NAMES ID # DATABASE #	AGENCY PURPOSE	SAMPLING DATES: 03/29/2001- 06/01/2001 NUMBER AND TYPES OF SAMPLES		
		Metals	Nutrients – Related	Other
At Dam VRSTN-A 100086	ADEQ Ambient	1-2 total metals samples: only: Antimony, arsenic, barium, beryllium, boron, cadmium, chromium, copper, lead, manganese, mercury, nickel, selenium, silver, zinc (0 dissolved metals)	3 samples: Ammonia, total nitrogen, nitrite/nitrate, and total Kjeldahl nitrogen, total phosphorus. 2 pH (0 Dissolved oxygen)	2 Fluoride 2 Turbidity 1 Total dissolved solids
Mid Lake VRSTN-B 100698	ADEQ Ambient			

EXCEEDANCES

POLLUTANT	STANDARD UNIT DESIGNATED USES	DATES EXCEEDANCES	DESIGNATED USE SUPPORT SUPPORTING EVIDENCE AND COMMENTS
Arsenic	50 µg/L FBC	03/29/2001 – 70.6 µg/L 05/09/2001 – 107 µg/L	Inconclusive – Exceeded in 2 of 2 samples collected. (Binomial requires a minimum of 5 exceedances and 20 samples to assess as impaired.) Lake was drying down at that time and has been totally dry most of the time since 2001.
pH	<9.0 SU A&Wc, FBC, AgI, AgL	06/01/2001 – 9.4 mg/L	Attaining – Low pH was a natural condition as lake evaporated.

Pollutant: Assume "total" concentration, unless shown as dissolved.
Frequency Exceed = Samples collected within a 7-day period are aggregated and counted as one sample (see assessment methods).

DATA GAPS AND MONITORING NEEDS

EXCEEDANCES NEEDING MORE SAMPLES TO ASSESS	MISSING CORE PARAMETERS	MISSING SEASONAL DISTRIBUTION	DETECTION LIMITS NOT LOW ENOUGH
Arsenic	Missing core parameters.	Only 2 season represented (March, May, June samples)	
MONITORING RECOMMENDATIONS		Medium Priority – Collect samples to determine the effectiveness of implemented strategies to reduce nutrient loading to the lake once the lake refills and water quality stabilizes. (Note that the lake has been completely dry for the past 3 years.) New narrative nutrient implementation procedures are being adopted and should be applied to this lake once water in the lake has been reestablished. Collect arsenic samples due to exceedances. Collect core parameters to represent at least three seasons during an assessment period.	

SYCAMORE CREEK From Cedar Creek to Verde River 15060202 – 026 11.7 miles	USE SUPPORT	OVERALL ASSESSMENT	
	A&Ww – Attaining FBC – Attaining FC – Attaining AgI - Attaining AgL – Attaining	Category 1 Attaining all uses	

MONITORING USED IN THIS ASSESSMENT

SITE NAMES ID # DATABASE #	AGENCY PURPOSE	SAMPLING PERIOD: 06/14/2000; 11/13/2003 - 06/22/2004 NUMBER AND TYPES OF SAMPLES		
		Metals	Nutrients – Related	Other
Below Summer Springs VRSYW001.72	ADEQ Ambient	3-4 dissolved and total samples: Antimony, arsenic, beryllium cadmium, copper, lead, zinc 4 total and 0-1 dissolved: Boron, chromium, manganese, and mercury	3-4 samples: Ammonia, dissolved oxygen, pH, total nitrogen, nitrite/nitrate, and total Kjeldahl nitrogen	4 *E. coli* bacteria 4 Fluoride 4 Suspended sediment concentration, 4 Turbidity, 3 Total dissolved solids
At mouth to Verde River VRSYW000.05 101558	USGS Special study			

EXCEEDANCES

POLLUTANT	STANDARD UNIT DESIGNATED USES	DATES EXCEEDANCES	DESIGNATED USE SUPPORT SUPPORTING EVIDENCE AND COMMENTS
No Exceedances			

Pollutant: Assume "total" concentration, unless shown as dissolved.
Frequency Exceed = Samples collected within a 7-day period are aggregated and counted as one sample per site.

DATA GAPS AND MONITORING NEEDS

EXCEEDANCES NEEDING MORE SAMPLES TO ASSESS	MISSING CORE PARAMETERS	MISSING SEASONAL DISTRIBUTION	DETECTION LIMITS NOT LOW ENOUGH
	Collected all core parameters		Lab detection limits for selenium and dissolved mercury were higher than A&W chronic criteria.
MONITORING RECOMMENDATIONS		Low Priority – The old turbidity standard (50 NTU) was exceeded in only 1 of 4 samples (05/13/2004 at 97 NTU). Recommend using biocriteria assessments and bottom deposits implementation procedures in this reach, when they are adopted. Use lower lab detection limits for selenium and dissolved mercury.	

SYCAMORE CREEK From headwaters to Verde River 15060203 – 055 13.2 miles	USE SUPPORT	OVERALL ASSESSMENT	
	A&Ww – Attaining FBC – Attaining FC – Attaining AgL – Attaining	Category 1 Attaining all uses	

MONITORING USED IN THIS ASSESSMENT

SITE NAMES ID # DATABASE #	AGENCY PURPOSE	SAMPLING PERIOD: 09/30/2003 – 04/29/2004 NUMBER AND TYPES OF SAMPLES		
		Metals	Nutrients – Related	Other
Above Sheeps Bridge VRSYH000.25 100656	ADEQ Fixed site	3-4 dissolved and total samples: Antimony, arsenic, beryllium, boron, cadmium, copper, lead, manganese, mercury, zinc. 4 total metals samples only: Boron, chromium, manganese	3-4 Ammonia, dissolved oxygen, pH, nitrite/nitrate, total nitrogen, total phosphorus, and total Kjeldahl nitrogen	4 *E. coli* bacteria 4 Fluoride 4 Suspended sediment concentration, 4 Turbidity, 4 Total dissolved solids

EXCEEDANCES

POLLUTANT	STANDARD UNIT DESIGNATED USES	DATES EXCEEDANCES	DESIGNATED USE SUPPORT SUPPORTING EVIDENCE AND COMMENTS
No Exceedances			

Frequency Exceed = Samples collected within a 7-day period are aggregated and counted as one sample (see assessment methods).

DATA GAPS AND MONITORING NEEDS

EXCEEDANCES NEEDING MORE SAMPLES TO ASSESS	MISSING CORE PARAMETERS	MISSING SEASONAL DISTRIBUTION	DETECTION LIMITS NOT LOW ENOUGH
	All core parameters collected		Lab detection limit for selenium was higher than the A&W chronic criteria.
MONITORING RECOMMENDATIONS		Low Priority – Use lower lab detection limits for selenium.	

VERDE RIVER From Granite Creek to Hell Canyon 15060202 – 052 16.4 miles	USE SUPPORT	OVERALL ASSESSMENT	
	A&Ww – Attaining FBC – Attaining FC – Attaining AgI - Attaining AgL – Attaining	Category 1 Attaining all uses	

MONITORING USED IN THIS ASSESSMENT

SITE NAMES ID # DATABASE #	AGENCY PURPOSE	SAMPLING PERIOD: 06/13/2000 – 06/23/2004 NUMBER AND TYPES OF SAMPLES		
		Metals	Nutrients – Related	Other
Below Granite Creek VRVER187.15 101556	USGS Special Study	3-5 dissolved and total samples: Antimony, arsenic, beryllium, cadmium, chromium, zinc 5 total and 1-2 dissolved metals: Boron, copper, lead, manganese, mercury	4-7 samples: Ammonia, dissolved oxygen, total nitrogen, nitrite/nitrate, and total Kjeldahl nitrogen, total phosphorus 16 samples: pH	4 *E. coli* bacteria 5 Fluoride 6 Suspended sediment concentration, 7 Turbidity, 5 Total dissolved solids
At Inscription Point VRVER185.21 100764	USGS and ADEQ Special Study			
Above Muldoon Cyn. VRVER181.03 102172	USGS Special Study			
Below Muldoon Cyn. VRVER180.99 102173	USGS Special Study			
At gage near Pauldin VRVER179.25 USGS # 09503700 100488	USGS Ambient			
At Bull Basin Canyon VRVER177.42 101566	USGS Special Study			
Above Duff Spring VRVER175.01 101564	USGS Special Study			
Below Duff Spring 2 VRVER174.73 101563	USGS Special Study			
Above Hell Canyon VRVER171.11 101571	USGS Special Study			

EXCEEDANCES

POLLUTANT	STANDARD UNIT DESIGNATED USES	DATES EXCEEDANCES	DESIGNATED USE SUPPORT SUPPORTING EVIDENCE AND COMMENTS
No Exceedances			

DATA GAPS AND MONITORING NEEDS

EXCEEDANCES NEEDING MORE SAMPLES TO ASSESS	MISSING CORE PARAMETERS	MISSING SEASONAL DISTRIBUTION	DETECTION LIMITS NOT LOW ENOUGH
	Collected all core parameters	None	Lab detection limits for dissolved mercury and selenium were higher than chronic A&W criteria.
MONITORING RECOMMENDATIONS		Low Priority – Use lower lab detection limits for selenium and dissolved mercury.	

VERDE RIVER From unnamed tributary (15060202-065) to Railroad Draw 15060202 – 037 10.7 miles	USE SUPPORT	OVERALL ASSESSMENT	POLLUTANTS CAUSING IMPAIRMENT	IMPAIRMENT STATUS
	A&Ww – Impaired FBC – Attaining FC – Attaining AgI - Attaining AgL – Attaining	Category 4A Not attaining (Impaired)	Turbidity	Turbidity TMDL completed in 2002. (See comment below)

MONITORING USED IN THIS ASSESSMENT

SITE NAMES ID # DATABASE #	AGENCY PURPOSE	SAMPLING PERIOD: 02/02/2000 – 04/20/2005 NUMBER AND TYPES OF SAMPLES		
		Metals	Nutrients – Related	Other
Below Perkinsville Bridge VRVER164.63 100487	ADEQ & USGS Ambient	7-24 dissolved and total samples: Antimony, arsenic, barium, beryllium, cadmium, chromium, copper, lead, nickel, silver, thallium, and zinc 21-24 total metals only: Boron, manganese 2 Mercury dissolved	21-24 samples: Ammonia, dissolved oxygen, pH, total nitrogen, nitrite/nitrate, and total Kjeldahl nitrogen, total phosphorus	20 *E. coli* bacteria 22 Fluoride 12 Suspended sediment concentration, 22 Turbidity, 18 Total dissolved solids
Below Spring at Perkinsville Bridge VRVER163.19 101569	USGS Special Study			
Below Orchard fault VRVER162.32 101567	USGS Special Study			
Above Mormon Pocket VRVER159.89 101565	USGS Special Study			
Near bench mark #1813 VRVER154.70 101562	USGS Special Study			

EXCEEDANCES

POLLUTANT	STANDARD UNIT DESIGNATED USES	DATES EXCEEDANCES	DESIGNATED USE SUPPORT SUPPORTING EVIDENCE AND COMMENTS
Arsenic	50 µg/L – FBC 200 µg/L – AgI	02/02/2000 – 240 µg/L	Attaining – Only 1 exceedance in 22 samples. (Binomial)
E. coli bacteria	235 CFU/100 ml FBC	08/27/2002 – 600 CFU/100 ml	Attaining – No exceedances in the last 3 years of monitoring (only 1 during the assessment period).
Mercury	0.6 µg/L FC	04/16/2002 – 0.79 µg/L	Attaining – Only 1 exceedance in 20 samples. (Binomial)

DATA GAPS AND MONITORING NEEDS

EXCEEDANCES NEEDING MORE SAMPLES TO ASSESS	MISSING CORE PARAMETERS	MISSING SEASONAL DISTRIBUTION	DETECTION LIMITS NOT LOW ENOUGH
E. coli bacteria	Collected all core parameters		Lab detection limits for dissolved mercury and selenium were higher than the chronic A&W criteria.
TURBIDITY IMPAIRMENT		Need to re-evaluate the turbidity TMDL developed in 2002 in terms of the new suspended sediment concentration (SSC) standard. None of the 12 SSC samples exceeded 80 mg/L, although 4 samples marginally exceeded the old turbidity standard (50 NTU).	
MONITORING RECOMMENDATIONS		Medium Priority – Collect more *E. coli* bacteria samples due to the exceedance. Continue to evaluate turbidity and suspended sediment. Recommend using biocriteria assessments and bottom deposits implementation procedures in this reach, when they are adopted. Use lower lab detection limits for dissolved mercury and selenium.	

VERDE RIVER From Sycamore Creek to Oak Creek 15060202 – 025 25.2 Miles	USE SUPPORT	OVERALL ASSESSMENT	POLLUTANTS CAUSING IMPAIRMENT	IMPAIRMENT STATUS
	A&Ww – Impaired FBC – Attaining FC – Attaining AgI - Attaining AgL – Attaining	Category 4A Not attaining (Impaired)	Turbidity	Turbidity TMDL completed in 2002. (See comment below)

MONITORING USED IN THIS ASSESSMENT

SITE NAMES ID # DATABASE #	AGENCY PURPOSE	SAMPLING PERIOD: 06/14/2000 – 09/09/2004 NUMBER AND TYPES OF SAMPLES		
		Metals	Nutrients – Related	Other
Half-mile below Sycamore Creek VRVER151.95 101555	USGS Special study	19-20 total and dissolved samples: Antimony, arsenic, barium, beryllium, boron, cadmium, chromium, copper, lead, manganese, nickel, selenium, silver, thallium, and zinc 20 total mercury (no dissolved)	19-20 samples: Ammonia, dissolved oxygen, pH, total phosphorus, total nitrogen, TKN, nitrite/nitrate	20 *E. coli* bacteria 20 Fluoride 20 Suspended sediment concentration 19 Turbidity 20 Total dissolved solids
Near Clarkdale VRVER150.65 USGS # 09504000 100738	USGS Ambient			
Above Railroad Trestle VRVER147.23 101554	USGS Special study			
Below Railroad Trestle VRVER146.91 101553	USGS Special study			
Above diversion dam VRVER142.16 101551	USGS Special study			
Below diversion dam VRVER140.64 101547	USGS Special study			

EXCEEDANCES

POLLUTANT	STANDARD UNIT DESIGNATED USES	DATES EXCEEDANCES	DESIGNATED USE SUPPORT SUPPORTING EVIDENCE AND COMMENTS
E. coli bacteria	235 CFU/100 ml FBC	11/01/2000 – 240 CFU/100 ml	Attaining – No exceedances in last three years (16 samples since exceedance). (Screening value of 300 CFU was not exceeded.)
Suspended sediment concentration (SSC)	Geometric mean 80 mg/L	01/12/2000 – 84 mg/L	Attaining – Exceeded 80 mg/L criterion in 1 of 20 samples. Geometric mean was not exceeded.

Pollutant: Assume "total" concentration, unless shown as dissolved.
Frequency Exceed = Samples collected within a 7-day period are aggregated and counted as one sample per site.

DATA GAPS AND MONITORING NEEDS

EXCEEDANCES NEEDING MORE SAMPLES TO ASSESS	MISSING CORE PARAMETERS	MISSING SEASONAL DISTRIBUTION	DETECTION LIMITS NOT LOW ENOUGH
	All core parameters collected.		Lab detection limit for selenium was higher than the A&W chronic standard.
TURBIDITY IMPAIRMENT		Need to re-evaluate the turbidity TMDL developed in 2002 in terms of the new suspended sediment concentration (SSC). Only 1 of 20 SSC samples exceeded the 80 mg/L.	
MONITORING RECOMMENDATIONS		Medium Priority – Continue to evaluate turbidity and suspended sediment. Recommend using biocriteria assessments and bottom deposits implementation procedures in this reach, when they are adopted. Use a lower lab detection limit for selenium.	

VERDE RIVER From Oak Creek to Beaver Creek 15060202 – 015 12.2 Miles	USE SUPPORT	OVERALL ASSESSMENT	POLLUTANTS CAUSING IMPAIRMENT	IMPAIRMENT STATUS
	A&Ww – Impaired FBC – Attaining FC – Attaining AgI - Attaining AgL – Attaining	Category 4A Not attaining (Impaired)	Turbidity	Turbidity TMDL completed in 2002. (See comment below)

MONITORING USED IN THIS ASSESSMENT

SITE NAMES ID # DATABASE #	AGENCY PURPOSE	SAMPLING PERIOD: 11/12/2003 – 06/22/2004 NUMBER AND TYPES OF SAMPLES		
		Metals	Nutrients – Related	Other
At 1000 Trails Mobile Home Park VRVER127.02 100481	ADEQ Ambient	3-4 total and dissolved samples: Antimony, arsenic, beryllium, cadmium, and zinc 4 total only: Boron, manganese 4 total and only 2 dissolved: Chromium, copper, lead, mercury	3-4 samples: Ammonia, dissolved oxygen, pH, total phosphorus, total nitrogen, TKN, nitrite/nitrate	4 *E. coli* bacteria 4 Fluoride 4 Suspended sediment concentration 3 Turbidity 4 Total dissolved solids

EXCEEDANCES

POLLUTANT	STANDARD UNIT DESIGNATED USES	DATES EXCEEDANCES	DESIGNATED USE SUPPORT SUPPORTING EVIDENCE AND COMMENTS
No Exceedances			

Pollutant: Assume "total" concentration, unless shown as dissolved.
Frequency Exceed = Samples collected within a 7-day period are aggregated and counted as one sample per site.

DATA GAPS AND MONITORING NEEDS

EXCEEDANCES NEEDING MORE SAMPLES TO ASSESS	MISSING CORE PARAMETERS	MISSING SEASONAL DISTRIBUTION	DETECTION LIMITS NOT LOW ENOUGH
No exceedances	Insufficient dissolved copper to assess A&W		Lab detection limit for selenium was higher than the A&W chronic criteria.
TURBIDITY IMPAIRMENT		Need to re-evaluate the turbidity TMDL developed in 2002 in terms of the new suspended sediment concentration (SSC). The SSC samples did not exceed 80 mg/L.	
MONITORING RECOMMENDATIONS		Medium Priority – Continue to evaluate turbidity and suspended sediment. Recommend using biocriteria assessments and bottom deposits implementation procedures in this reach, when they are adopted. Collect missing core parameters (dissolved copper) to represent at least 3 seasons during the assessment period. Use a lower lab detection limit for selenium.	

VERDE RIVER From 15060203 boundary to West Clear Creek 15060203 – 027 6.4 miles	USE SUPPORT	OVERALL ASSESSMENT	POLLUTANTS CAUSING IMPAIRMENT	IMPAIRMENT STATUS
	A&Ww – Impaired FBC – Attaining FC – Attaining AgI - Attaining AgL – Attaining	Category 4A Not attaining (Impaired)	Turbidity	Turbidity TMDL completed in 2002. (See comment below)

MONITORING USED IN THIS ASSESSMENT

SITE NAMES ID # DATABASE #	AGENCY PURPOSE	SAMPLING PERIOD: 10/08/2003 – 06/21/2004		
		NUMBER AND TYPES OF SAMPLES		
		Metals	Nutrients – Related	Other
Above West Clear Creek VRVER107.68 100723	ADEQ Ambient	3-4 dissolved and total: Antimony, arsenic, beryllium, boron, cadmium, chromium, copper, lead, manganese, zinc. 4 total and 2 dissolved: Mercury. 1 Barium	4 Ammonia, dissolved oxygen, pH, total nitrogen, total phosphorus, nitrite/nitrate, and total Kjeldahl nitrogen	3 *E. coli* bacteria 4 Fluoride 4 Suspended sediment concentration, 4 Turbidity, 4 Total dissolved solids

EXCEEDANCES

POLLUTANT	STANDARD UNIT DESIGNATED USES	DATES EXCEEDANCES	DESIGNATED USE SUPPORT SUPPORTING EVIDENCE AND COMMENTS
No Exceedances			

Pollutant: Assume "total" concentration, unless shown as dissolved.
Frequency Exceed = Samples collected within a 7-day period are aggregated and counted as one sample per site.

DATA GAPS AND MONITORING NEEDS

EXCEEDANCES NEEDING MORE SAMPLES TO ASSESS	MISSING CORE PARAMETERS	MISSING SEASONAL DISTRIBUTION	DETECTION LIMITS NOT LOW ENOUGH
	All core parameters collected.		Lab detection limits for selenium and dissolved mercury were higher than A&W chronic criteria.
TURBIDITY IMPAIRMENT		Need to re-evaluate the turbidity TMDL developed in 2002 in terms of the new suspended sediment concentration (SSC). The SSC samples did not exceed 80 mg/L.	
MONITORING RECOMMENDATIONS		Medium Priority – Continue to evaluate turbidity and suspended sediment concentration. Use lower lab detection limits for dissolved mercury and total selenium.	

VERDE RIVER From West Clear Creek to Fossil Creek 15060203 – 025 23.6 miles	USE SUPPORT	OVERALL ASSESSMENT	POLLUTANTS CAUSING IMPAIRMENT	IMPAIRMENT STATUS
	A&Ww – Impaired FBC – Attaining FC – Attaining AgI - Attaining AgL – Attaining	Category 4A Not attaining (Impaired)	Turbidity	Turbidity TMDL completed in 2002. (See comment below)

MONITORING USED IN THIS ASSESSMENT

SITE NAMES ID # DATABASE #	AGENCY PURPOSE	SAMPLING PERIOD: 02/01/2000 – 04/21/2005 NUMBER AND TYPES OF SAMPLES		
		Metals	Nutrients – Related	Other
At Beasley Flat VRVER103.73 100677	USGS Ambient	5-24 dissolved and total: Antimony, arsenic, barium, beryllium, boron, cadmium, chromium, copper, lead, manganese, mercury, nickel, silver, thallium, and zinc.	22-24 Ammonia, dissolved oxygen, pH, total nitrogen, total phosphorus, nitrite/nitrate, and total Kjeldahl nitrogen	20 *E. coli* bacteria 22 Fluoride 11 Suspended sediment concentration, 17 Turbidity, 18 Total dissolved solids
At Beasley Flat VRVER103.60 100477	ADEQ Ambient			

EXCEEDANCES

POLLUTANT	STANDARD UNIT DESIGNATED USES	DATES EXCEEDANCES	DESIGNATED USE SUPPORT SUPPORTING EVIDENCE AND COMMENTS
E. coli bacteria	235 CFU/100 ml FBC	08/26/2002 – 307 CFU/100 ml	Attaining – No exceedances in the last 3 years of monitoring. (11 samples since the 1 exceedance)
Suspended sediment concentration (SSC)	Geometric mean 80 mg/L	12/15/2004 – 105 mg/L	Attaining – Only 1 of 11 samples exceeded the 80 mg/L criterion. The geometric mean of 4 consecutive samples was not exceeded.

Pollutant: Assume "total" concentration, unless shown as dissolved.
Frequency Exceed = Samples collected within a 7-day period are aggregated and counted as one sample (see assessment methods).

DATA GAPS AND MONITORING NEEDS

EXCEEDANCES NEEDING MORE SAMPLES TO ASSESS	MISSING CORE PARAMETERS	MISSING SEASONAL DISTRIBUTION	DETECTION LIMITS NOT LOW ENOUGH
	All core parameters collected.		Lab detection limits for dissolved mercury and total selenium higher than A&W chronic criteria.
TURBIDITY IMPAIRMENT		Need to re-evaluate the turbidity TMDL developed in 2002 in terms of the new suspended sediment concentration (SSC). Only 1 of 11 SSC samples exceeded the 80 mg/L.	
MONITORING RECOMMENDATIONS		Medium Priority – Continue to evaluated turbidity and suspended sediment concentration impacts in this reach. Recommend using biocriteria assessments and bottom deposits implementation procedures in this reach, when they are adopted. Use lower lab detection limits for dissolved mercury and total selenium.	

VERDE RIVER From Wet Bottom Mesa to Tangle Creek 15060203 – 018 4.1 miles	USE SUPPORT	OVERALL ASSESSMENT	
	A&Ww – Attaining FBC – Attaining FC – Attaining AgI – Attaining AgL – Attaining	Category 1 Attaining all uses	

MONITORING USED IN THIS ASSESSMENT

SITE NAMES ID # DATABASE #	AGENCY PURPOSE	SAMPLING PERIOD: 03/29/2000 – 08/13/2004 NUMBER AND TYPES OF SAMPLES		
		Metals	Nutrients – Related	Other
Below Sheep Bridge VRVER053.70 100678	ADEQ Ambient	18-23 dissolved and total: Antimony, arsenic, barium, beryllium, boron, cadmium, chromium, copper, lead, manganese, nickel, selenium, silver, thallium, and zinc. 22 total metals and 4 dissolved: Mercury	22-23 Ammonia, dissolved oxygen, pH, total nitrogen, total phosphorus, nitrite/nitrate, and total Kjeldahl nitrogen	22 *E. coli* bacteria 22 fluoride 23 suspended sediment concentration, 22 turbidity, 22 total dissolved solids
Below Tangle Creek VRVER053.21 USGS #09508500 100740	USGS Fixed site			

EXCEEDANCES

POLLUTANT	STANDARD UNIT DESIGNATED USES	DATES EXCEEDANCES	DESIGNATED USE SUPPORT SUPPORTING EVIDENCE AND COMMENTS
E. coli bacteria	235 CFU/100 ml FBC	08/30/2000 – 770 CFU/100 ml	Attaining – No exceedances in the last 3 years or monitoring (21 samples).
Suspended sediment concentration (SSC)	Geometric mean 80 mg/L	08/30/2000 – 106 mg/L 08/13/2004 – 103 mg/L	Attaining – 2 of 23 samples exceeded the 80 mg/L criterion. The geometric mean of 4 consecutive samples did not exceed the standard.

Pollutant: Assume "total" concentration, unless shown as dissolved.
Frequency Exceed = Samples collected within a 7-day period are aggregated and counted as one sample (see assessment methods).

DATA GAPS AND MONITORING NEEDS

EXCEEDANCES NEEDING MORE SAMPLES TO ASSESS	MISSING CORE PARAMETERS	MISSING SEASONAL DISTRIBUTION	DETECTION LIMITS NOT LOW ENOUGH
	All core parameters collected.		
MONITORING RECOMMENDATIONS		Low Priority – Recommend using biocriteria assessments and bottom deposits implementation procedures in this reach, when they are adopted.	

VERDE RIVER From Horseshoe Dam to Alder Creek 15060203 – 008 10.7 Miles	USE SUPPORT	OVERALL ASSESSMENT	
	A&Ww – Inconclusive FBC – Inconclusive FC – Inconclusive DWS – Inconclusive AgI – Inconclusive AgL – Inconclusive	Category 3 Inconclusive	

MONITORING USED IN THIS ASSESSMENT

SITE NAMES ID # DATABASE #	AGENCY PURPOSE	SAMPLING DATE: 09/23/2004 (both sites)		
		NUMBER AND TYPES OF SAMPLES		
		Metals	Nutrients – Related	Other
Below Horseshoe Dam VRVER044.71 102836	AGFD Ambient		1 samples: Ammonia, total nitrogen, total Kjeldahl nitrogen, nitrite/nitrate, dissolved oxygen, pH	1 Turbidity, 1 Total dissolved solids
Below Horseshoe Dam VRVER040.13 100831	ADEQ Ambient			

EXCEEDANCES

POLLUTANT	STANDARD UNIT DESIGNATED USES	DATES EXCEEDANCES	DESIGNATED USE SUPPORT SUPPORTING EVIDENCE AND COMMENTS
No Exceedances			

Pollutant: Assume "total" concentration, unless shown as dissolved.
Frequency Exceed = Samples collected within a 7-day period are aggregated and counted as one sample per site.

DATA GAPS AND MONITORING NEEDS

EXCEEDANCES NEEDING MORE SAMPLES TO ASSESS	MISSING CORE PARAMETERS	MISSING SEASONAL DISTRIBUTION	DETECTION LIMITS NOT LOW ENOUGH
	Insufficient core parameters	Insufficient sampling events.	
MONITORING RECOMMENDATIONS		Low Priority – Collect core parameters to represent at least 3 seasons during the assessment period.	

VERDE RIVER From Bartlett Dam to Camp Creek 15060203 – 004 11.6 Miles	USE SUPPORT	OVERALL ASSESSMENT	POLLUTANTS CAUSING IMPAIRMENT	IMPAIRMENT STATUS
	A&Ww – Attaining FBC – Attaining FC – Attaining DWS – Attaining AgI – Attaining AgL – Attaining	Category 1 Attaining all uses		Delist copper and selenium. (See comments below)

MONITORING USED IN THIS ASSESSMENT

SITE NAMES ID # DATABASE #	AGENCY PURPOSE	SAMPLING PERIOD: 02/02/2000 – 08/18/2004 NUMBER AND TYPES OF SAMPLES		
		Metals	Nutrients – Related	Other
Below Bartlett Lake VRVER022.53 USGS #09510000 100741	USGS Ambient	22 dissolved and total: Antimony, arsenic, barium, beryllium, boron, cadmium, chromium, copper, lead, manganese, nickel, selenium, silver, thallium, and zinc. 22 total mercury.	15-18: Ammonia, total nitrogen, total Kjeldahl nitrogen, total phosphorus, nitrite/nitrate, pH, dissolved oxygen	21 or more: suspended sediment concentration, total dissolved solids, turbidity, temperature, *E. coli* bacteria

EXCEEDANCES

POLLUTANT	STANDARD UNIT DESIGNATED USES	DATES EXCEEDANCES	DESIGNATED USE SUPPORT SUPPORTING EVIDENCE AND COMMENTS
No Exceedances			

Pollutant: Assume "total" concentration, unless shown as dissolved.
Frequency Exceed = Samples collected within a 7-day period are aggregated and counted as one sample (see assessment methods).

DATA GAPS AND MONITORING NEEDS

EXCEEDANCES NEEDING MORE SAMPLES TO ASSESS	MISSING CORE PARAMETERS	MISSING SEASONAL DISTRIBUTION	DETECTION LIMITS NOT LOW ENOUGH
	All core parameters collected.		Lab detection limit for dissolved mercury was higher than the A&W chronic criteria.
DISCUSSION OF COPPER IMPAIRMENT		Delist copper. No exceedances in 22 total and dissolved copper samples. No known probable sources of copper in this reach or on its tributaries. Delist selenium. No exceedances in 22 total selenium samples. No reported selenium exceedances in the entire watershed.	
MONITORING RECOMMENDATIONS		Low Priority – Use lower lab detection limit for dissolved mercury.	

WALNUT CREEK From Apache Creek to Big Chino Wash 15060201 – 017 20.1 Miles	USE SUPPORT	OVERALL ASSESSMENT	
	A&Ww – Inconclusive FBC – Inconclusive FC – Inconclusive AgL – Inconclusive	Category 3 Inconclusive	

MONITORING USED IN THIS ASSESSMENT

SITE NAMES ID # DATABASE #	AGENCY PURPOSE	SAMPLING DATES: 03/01/2004 – 05/03/2004 (dry in summer) NUMBER AND TYPES OF SAMPLES Metals	Nutrients – Related	Other
Above Forest Road #95 VRWAL018.97 100681	ADEQ Ambient	1-2 dissolved and total samples: Antimony, arsenic, beryllium, boron, cadmium, chromium, copper, lead, manganese, zinc. 1 total metal only: Mercury	2 samples: Dissolved oxygen, pH, total nitrogen, total phosphorus, nitrite/nitrate, and total Kjeldahl nitrogen. 4 samples: Ammonia	2 *E. coli* bacteria 2 Fluoride 2 Suspended sediment concentration, 2 Turbidity, 2 Total dissolved solids

EXCEEDANCES

POLLUTANT	STANDARD UNIT DESIGNATED USES	DATES EXCEEDANCES	DESIGNATED USE SUPPORT SUPPORTING EVIDENCE AND COMMENTS
No Exceedances			

Pollutant: Assume "total" concentration, unless shown as dissolved.
Frequency Exceed = Samples collected within a 7-day period are aggregated and counted as one sample (see assessment methods).

DATA GAPS AND MONITORING NEEDS

EXCEEDANCES NEEDING MORE SAMPLES TO ASSESS	MISSING CORE PARAMETERS	MISSING SEASONAL DISTRIBUTION	DETECTION LIMITS NOT LOW ENOUGH
	Insufficient core parameters	Only 2 seasons represented	Lab detection limits for dissolved metals (copper, lead, mercury) and selenium were higher than A&W chronic criteria.
MONITORING RECOMMENDATIONS		Low Priority – Collect core parameters to represent at least 3 seasons during an assessment period. Use lower lab detection limits for dissolved mercury, dissolved copper, dissolved lead, and total selenium.	

WATSON LAKE 15060202 – 1590 150 Acres	USE SUPPORT		OVERALL ASSESSMENT	POLLUTANTS CAUSING IMPAIRMENT	IMPAIRMENT STATUS
	A D E Q	A&Ww – Inconclusive FBC – Inconclusive FC – Inconclusive AgI – Inconclusive AgL – Inconclusive	Category 3 Inconclusive		
	E P A	A&Ww – Impaired FBC – Impaired AgI – Impaired AgL – Impaired (Affected uses only)	Category 5 Impaired	Nitrogen, dissolved oxygen, and pH	EPA listed lake as impaired in 2004.

Light blue highlights indicate EPA impairments based on EPA assessment and listing criteria. This listing may change when EPA reviews and approves the 2006 impaired waters list. Such listings do not satisfy requirements established in Arizona's Impaired Water Identification Rule; therefore, they are not included in the list of Arizona's impaired waters (Appendix B and Appendix C).

MONITORING USED IN THIS ASSESSMENT

SITE NAMES ID # DATABASE #	AGENCY PURPOSE	SAMPLING PERIOD: 07/06/2000 – 08/06/2003 NUMBER AND TYPES OF SAMPLES		
		Metals	Nutrients – Related	Other
At Dam VRWAT-A 101353	ADEQ & AGFD Ambient	4 total and dissolved metals samples: Antimony, arsenic, barium, beryllium, boron, cadmium, chromium, copper, lead, manganese, nickel, selenium, silver, zinc 4 total metals only: Mercury	5 samples: Ammonia, total nitrogen, nitrite/nitrate, and total Kjeldahl nitrogen, total phosphorus, dissolved oxygen, and pH	4 *E. coli* bacteria 4 Fluoride 4 Turbidity 5 Total dissolved solids
At south end of lake VRWAT-SO 102564	AGFD Fish Kill Investigation			
At boat ramp VRWAT-BR 101397	AGFD & AGFD Ambient			

EXCEEDANCES

POLLUTANT	STANDARD UNIT DESIGNATED USES	DATES – EXCEEDANCE	DESIGNATED USE SUPPORT SUPPORTING EVIDENCE AND COMMENTS
Dissolved oxygen	6 mg/L A&Ww	05/23/2002 – 5.6 mg/L	Inconclusive – Dissolved oxygen was too low in 1 of 4 sample dates at 2 sites. (Binomial)
Total Nitrogen	3 mg/L A&Ww, FBC	07/06/2000 – 4.05 mg/L 05/23/2002 – 3.1 mg/L 08/29/2002 – 4.85 mg/L	Inconclusive – 3 of 6 samples exceeded the criterion. (Binomial) Nitrogen exceedance on 07/06/2000 occurred during a fish kill investigation.
pH	<9.0 SU A&Ww, FBC, AgI, AgL	07/06/2000 – 9.8 SU	Inconclusive -- High pH readings at several sites during the fish kill investigation on 07/06/2000.

Pollutant: Assume "total" concentration, unless shown as dissolved.
Frequency Exceed = Samples collected within a 7-day period are aggregated and counted as one sample (see assessment methods).

DATA GAPS AND MONITORING NEEDS			
EXCEEDANCES NEEDING MORE SAMPLES TO ASSESS	**MISSING CORE PARAMETERS**	**MISSING SEASONAL DISTRIBUTION**	**DETECTION LIMITS NOT LOW ENOUGH**
	Collected all core parameters		Lab detection limit for dissolved mercury is higher than A&W chronic criterion.
DISCUSSION OF IMPAIRMENTS		Evidence of potential nutrient impairment (nitrogen, low DO, and pH): 1. No additional data since the last assessment; 2. Exceedances occurred during a fish kill investigation; and 3. Repeated elevated nitrogen values compared to standards.	
MONITORING RECOMMENDATIONS		High Priority –Collect samples to support TMDL development. Low dissolved oxygen, high pH, and elevated nutrients may be symptoms of excess nutrient loading. New methods for implementing the narrative nutrient standard should be applied to this lake once adopted, to determine whether narrative nutrient violations are occurring.	

WEST CLEAR CREEK From Meadow Canyon to Verde River 15060203 – 026B 23.5 miles	USE SUPPORT	OVERALL ASSESSMENT	
	A&Ww – Attaining FBC – Attaining FC – Attaining AgI – Attaining AgL – Attaining	Category 1 Attaining all uses	

MONITORING USED IN THIS ASSESSMENT

SITE NAMES ID # DATABASE #	AGENCY PURPOSE	SAMPLING PERIOD: 01/11/2000 – 08/18/2004 NUMBER AND TYPES OF SAMPLES		
		Metals	Nutrients – Related	Other
Near Camp Verde VRWCL010.66 USGS #09505800 100749	USGS Ambient	3-4 dissolved and total samples: Antimony, arsenic, beryllium, boron, cadmium, chromium, copper, lead, manganese, zinc. 4 total and 0-1 dissolved: Boron, beryllium, and mercury	26-33 samples: Dissolved oxygen, pH, total nitrogen, total phosphorus, nitrite/nitrate, and total Kjeldahl nitrogen. 4 samples: Ammonia	3 *E. coli* bacteria 4 Fluoride 4 Suspended sediment concentration, 4 Turbidity, 4 Total dissolved solids 8 Pesticides (e.g. DDE, carbofuran, etc)

EXCEEDANCES

POLLUTANT	STANDARD UNIT DESIGNATED USES	DATES EXCEEDANCES	DESIGNATED USE SUPPORT SUPPORTING EVIDENCE AND COMMENTS
No Exceedances			

Pollutant: Assume "total" concentration, unless shown as dissolved.
Frequency Exceed = Samples collected within a 7-day period are aggregated and counted as one sample (see assessment methods).

DATA GAPS AND MONITORING NEEDS

EXCEEDANCES NEEDING MORE SAMPLES TO ASSESS	MISSING CORE PARAMETERS	MISSING SEASONAL DISTRIBUTION	DETECTION LIMITS NOT LOW ENOUGH
No exceedances	All core parameters collected		Lab detection limits for dissolved mercury and total selenium were higher than A&W chronic criteria.
MONITORING RECOMMENDATIONS		Low Priority – Use lower lab detection limits for dissolved mercury and total selenium.	

WEST FORK OAK CREEK From headwaters to Oak Creek 15060202 – 020 15.8 Miles Unique Water	USE SUPPORT	OVERALL ASSESSMENT	
	A&Wc – Attaining FBC – Attaining FC – Attaining AgL – Attaining	Category 1 Attaining all uses	

MONITORING USED IN THIS ASSESSMENT				
SITE NAMES ID # DATABASE #	AGENCY PURPOSE	SAMPLING PERIOD: 08/13/2003 – 05/27/2004		
		NUMBER AND TYPES OF SAMPLES		
		Metals	Nutrients – Related	Other
Above 4th trail crossing VRWOK000.82 100693	ADEQ Ambient	3-4 dissolved and total samples: Antimony, arsenic, beryllium, cadmium, chromium, copper, zinc 4 total and 0-2 dissolved: Boron, manganese, mercury, lead	4-7 samples: Ammonia, total nitrogen, nitrite/nitrate, and total Kjeldahl nitrogen, total phosphorus, dissolved oxygen and pH	7 *E. coli* bacteria 4 Fluoride 7 Suspended sediment concentration 7 Turbidity 4 Total dissolved solids
At Mouth VRWOK000.10 101865	ADEQ TMDL			

EXCEEDANCES			
POLLUTANT	STANDARD UNIT DESIGNATED USES	DATES EXCEEDANCES	DESIGNATED USE SUPPORT SUPPORTING EVIDENCE AND COMMENTS
Dissolved oxygen	7.0 mg/L A&Wc	8/13/2003 – 6.3 mg/L	Attaining – Low dissolved oxygen due to natural conditions of low flow and groundwater upwelling. (Drought conditions and flow reduced to 0.5 cfs.) Low nitrogen and phosphorus levels.
Suspended sediment concentration (SSC)	Geometric mean 80 mg/L A&Wc	01/11/2005 – 524 mg/L	Attaining – The 1 sample that exceeded the 80 mg/L was collected during a high flow event, so the value could not be used in the geometric mean calculation. The geometric mean of 4 consecutive samples did not exceed the standard.

Pollutant: Assume "total" concentration, unless shown as dissolved.
Frequency Exceed = Samples collected within a 7-day period are aggregated and counted as one sample per site.

DATA GAPS AND MONITORING NEEDS			
EXCEEDANCES NEEDING MORE SAMPLES TO ASSESS	MISSING CORE PARAMETERS	MISSING SEASONAL DISTRIBUTION	DETECTION LIMITS NOT LOW ENOUGH
None	All core parameters collected.		Lab detection limit for selenium was higher than the A&W chronic criterion.
MONITORING RECOMMENDATIONS		Low Priority – Use lower lab detection limit for selenium. Recommend using biocriteria assessments and bottom deposits implementation procedures in this reach, when they are adopted.	

WET BEAVER CREEK From Long Canyon to Rarick Creek 15060202 – 004 6.5 Miles	USE SUPPORT	OVERALL ASSESSMENT	
	A&Wc – Attaining FBC – Attaining FC – Attaining AgI – Attaining AgL – Attaining	Category 1 Attaining all uses	

MONITORING USED IN THIS ASSESSMENT

SITE NAMES ID # DATABASE #	AGENCY PURPOSE	SAMPLING PERIOD: 10/08/2003 – 05/18/2004		
		NUMBER AND TYPES OF SAMPLES		
		Metals	Nutrients – Related	Other
At USGS gage near Rimrock #09505200 VRWBV012.35 100497	USGS Ambient	3-4 dissolved and total samples: Antimony, barium, boron, cadmium, chromium, copper, lead, manganese, zinc. 4 total and 1 dissolved: Beryllium	3-4 samples: Ammonia, dissolved oxygen, pH, total phosphorus, total nitrogen, total phosphorus, nitrite/nitrate	3 E. coli bacteria 3 Suspended sediment 4 Turbidity 4 Total dissolved solids

EXCEEDANCES

POLLUTANT	STANDARD UNIT DESIGNATED USES	DATES EXCEEDANCES	DESIGNATED USE SUPPORT SUPPORTING EVIDENCE AND COMMENTS
No Exceedances			

Pollutant: Assume "total" concentration, unless shown as dissolved.
Frequency Exceed = Samples collected within a 7-day period are aggregated and counted as one sample (see assessment methods).

DATA GAPS AND MONITORING NEEDS

EXCEEDANCES NEEDING MORE SAMPLES TO ASSESS	MISSING CORE PARAMETERS	MISSING SEASONAL DISTRIBUTION	DETECTION LIMITS NOT LOW ENOUGH
No exceedances	All core parameters collected.		Lab detection limits for selenium and dissolved metals (copper, lead, and mercury) were higher than A&W chronic criteria in at least 1 sample.
MONITORING RECOMMENDATIONS		Low Priority – Use lower lab detection limits for selenium and dissolved metals.	

WET BEAVER CREEK From Rarick Creek to Dry Beaver Creek 15060202 – 003 6.6 Miles	USE SUPPORT	OVERALL ASSESSMENT	
	A&Wc – Inconclusive FBC – Inconclusive FC – Inconclusive AgI – Inconclusive AgL – Inconclusive	Category 3 Inconclusive	

MONITORING USED IN THIS ASSESSMENT				
SITE NAMES ID # DATABASE #	AGENCY PURPOSE	SAMPLING PERIOD: 11/26/2002 – 09/05/2003		
		NUMBER AND TYPES OF SAMPLES		
		Metals	Nutrients – Related	Other
In Montezuma Castle National Monument VRWBV006.50 101543	USGS Ambient	3 dissolved metal samples: Antimony, barium, beryllium, boron, cadmium, chromium, copper, lead, manganese, nickel, silver, uranium, zinc. (No total metals samples)	3 samples: Dissolved oxygen, pH, total phosphorus	3 Suspended sediment 3 Total dissolved solids

EXCEEDANCES			
POLLUTANT	STANDARD UNIT DESIGNATED USES	DATES EXCEEDANCES	DESIGNATED USE SUPPORT SUPPORTING EVIDENCE AND COMMENTS
No Exceedances			

Pollutant: Assume "total" concentration, unless shown as dissolved.
Frequency Exceed = Samples collected within a 7-day period are aggregated and counted as one sample (see assessment methods).

DATA GAPS AND MONITORING NEEDS			
EXCEEDANCES NEEDING MORE SAMPLES TO ASSESS	MISSING CORE PARAMETERS	MISSING SEASONAL DISTRIBUTION	DETECTION LIMITS NOT LOW ENOUGH
	Insufficient nitrogen, phosphorus, *E. coli* bacteria, boron, copper, lead, manganese, and mercury to assess A&W, FC, FBC, AgI and AgL		
MONITORING RECOMMENDATIONS		Low Priority – Collect core parameters to represent at least three seasons during an assessment period.	

WHITEHORSE LAKE 15060202 – 1630 40 Acres	USE SUPPORT		OVERALL ASSESSMENT	POLLUTANTS CAUSING IMPAIRMENT	IMPAIRMENT STATUS
	A D E Q	A&Wc – Inconclusive FBC – Inconclusive FC – Attaining DWS -- Attaining AgI – Attaining AgL – Attaining	Category 2 Attaining some uses		
	E P A	A&Wc – Impaired	Category 5 Impaired		EPA listed in 2004 due to low dissolved oxygen. (See discussion below)

Light blue highlights indicate EPA impairments based on EPA assessment and listing criteria. This listing may change when EPA reviews and approves the 2006 impaired waters list. Such listings do not satisfy requirements established in Arizona's Impaired Water Identification Rule; therefore, they are not included in the list of Arizona's impaired waters (Appendix B and Appendix C).

MONITORING USED IN THIS ASSESSMENT

SITE NAMES ID # DATABASE #	AGENCY PURPOSE	SAMPLING PERIOD: 07/26/2000 – 03/18/2002 NUMBER AND TYPES OF SAMPLES		
		Metals	Nutrients – Related	Other
At Dam VRWHH-A 100090	ADEQ Ambient	10-11 total and 1 dissolved metals samples: Antimony, arsenic, barium, beryllium, boron, cadmium, chromium, copper, lead, manganese, nickel, selenium, silver, zinc 4 total metals only: Mercury	10-11 samples: Ammonia, total nitrogen, nitrite/nitrate, and total Kjeldahl nitrogen, total phosphorus, dissolved oxygen, and pH	2 *E. coli* bacteria 10 Fluoride 9 Total dissolved solids
At boat ramp VRWHH-BR 101317	AGFD & AGFD Ambient			

EXCEEDANCES

POLLUTANT	STANDARD UNIT DESIGNATED USE	DATES – EXCEEDANCE	DESIGNATED USE SUPPORT SUPPORTING EVIDENCE AND COMMENTS
Dissolved oxygen	7 mg/L A&Ww	09/08/2000 – 4.7 mg/L	Attaining – Dissolved oxygen was below standards in only 1 of 11 sampling events. (Binomial) No indication of impairment. Remove from 303(d) List.
Nickel (total)	140 mg/L DWS	03/28/2001 – 210 µg/L	Attaining – Only one of eleven samples exceeded the standard. (Binomial)

Pollutant: Assume "total" concentration, unless shown as dissolved.
Frequency Exceed = Samples collected within a 7-day period are aggregated and counted as one sample per site.

DATA GAPS AND MONITORING NEEDS

EXCEEDANCES NEEDING MORE SAMPLES TO ASSESS	MISSING CORE PARAMETERS	MISSING SEASONAL DISTRIBUTION	DETECTION LIMITS NOT LOW ENOUGH
	Insufficient dissolved metals (cadmium, copper, zinc) and *E. coli* bacteria to assess A&W and FBC.		Lab detection limits for selenium and dissolved metals (cadmium, copper, lead, mercury) were higher than A&W chronic criteria for at least 1 sample.
DISCUSSION OF DISSOLVED OXYGEN IMPAIRMENT		Evidence of potential impairment: Newer data does not show impairment as only 1 low dissolved oxygen measurement in the top meter in 11 samples. (Original listing was based on 5 of 10 samples not meeting DO standards.)	
MONITORING RECOMMENDATIONS		Low Priority – Collect missing core parameters to represent at least 3 seasons during the assessment period. Use lower lab detection limits for dissolved metals and selenium.	

WILLOW CREEK RESERVOIR 15060202 – 1660 295 Acres	USE SUPPORT	OVERALL ASSESSMENT	
	A&Wc – Inconclusive FBC – Inconclusive FC – Inconclusive AgI – Inconclusive AgL – Inconclusive	Category 3 Attaining some uses	

MONITORING USED IN THIS ASSESSMENT

SITE NAMES ID # DATABASE #	AGENCY PURPOSE	SAMPLING DATES: 02/11/2004, 06/22/2004 NUMBER AND TYPES OF SAMPLES		
		Metals	Nutrients – Related	Other
At Dam VRWIC-A 101922	ADEQ Ambient	2 total and 2 dissolved metals samples: Cadmium, chromium, copper, lead, nickel, silver, zinc 2 total only metals: Antimony, arsenic, barium, beryllium, boron, manganese, mercury, selenium, thallium	2 samples: Ammonia, total nitrogen, nitrite/nitrate, and total Kjeldahl nitrogen, total phosphorus, dissolved oxygen, and pH	3 *E. coli* bacteria 2 Fluoride 2 Total dissolved solids

EXCEEDANCES

POLLUTANT	STANDARD UNIT DESIGNATED USE	DATES EXCEEDANCES	DESIGNATED USE SUPPORT SUPPORTING EVIDENCE AND COMMENTS
pH	<9.0 SU A&Wc, FBC, DWS, AgI, AgL	06/22/2004 – 9.5 SU	Only 1 exceedance in 2 samples. Need more monitoring data to assess.

Pollutant: Assume "total" concentration, unless shown as dissolved.
Frequency Exceed = Samples collected within a 7-day period are aggregated and counted as one sample (see assessment methods).

DATA GAPS AND MONITORING NEEDS

EXCEEDANCES NEEDING MORE SAMPLES TO ASSESS	MISSING CORE PARAMETERS	MISSING SEASONAL DISTRIBUTION	DETECTION LIMITS NOT LOW ENOUGH
pH	Insufficient core parameters	Insufficient sampling events	
MONITORING RECOMMENDATIONS		Medium Priority – Collect additional pH measurements due to an exceedance. Elevated pH may be a symptom of excess nutrient loading. New methods for implementing the narrative nutrient standard should be applied to this lake once adopted, to determine whether narrative nutrient violations are occurring. Collect core parameters to represent at least three seasons during the assessment period.	